



# **FCC RF Test Report**

**Product Name: HSDPA/HSUPA/UMTS/GSM/GPRS/EDGE  
Mobile Phone with Bluetooth**

**Model Number: U6020**

**Report No: SYBH(Z-RF)022062012-2001  
FCC ID: QISU6020**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China  
Tel: +86 755 28780808 Fax: +86 755 89652518

## Notice

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
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9. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.

|                                   |                                                                         |
|-----------------------------------|-------------------------------------------------------------------------|
| <b>Applicant:</b>                 | Huawei Technologies Co., Ltd.                                           |
| <b>Address:</b>                   | Huawei Base, Bantian, Longgang District, Shenzhen<br>518129, P.R. China |
| <b>Date of Receipt Test Item:</b> | Jun., 24, 2012                                                          |
| <b>Start Date of Test:</b>        | Jun., 25, 2012                                                          |
| <b>End Date of Test:</b>          | Jun., 30, 2012                                                          |
|                                   |                                                                         |
|                                   |                                                                         |
| <b>Test Result:</b>               | Pass                                                                    |

Approved By Senior Engineer    Aug., 13, 2012    Dai Linjun    *Dai Linjun*  
Date    Name    Signature

Reviewed By    Aug., 13, 2012    Cousy Xu    *Cousy XU*  
Date    Name    Signature

Operated By    Aug., 13, 2012    Huang Qiuliang    *Huang Qiuliang*  
Date    Name    Signature

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# 1 General Information

|                                         |                                                                                               |
|-----------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>1.1 Applied Standard</b>             |                                                                                               |
|                                         |                                                                                               |
| Applied Rules:                          | 47 CFR FCC Part 2:2010, Subpart J<br>47 CFR FCC Part 22:2010, Subpart H<br>ANSI/TIA 603C:2004 |
|                                         |                                                                                               |
| <b>1.2 Test Location</b>                |                                                                                               |
|                                         |                                                                                               |
| Test Location 1:                        | Reliability Laboratory of Huawei Technologies Co., Ltd.                                       |
| Address:                                | Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China                          |
|                                         |                                                                                               |
| <b>1.3 Test Environmental Condition</b> |                                                                                               |
|                                         |                                                                                               |
| Ambient Temperature:                    | 20 – 25 °C                                                                                    |
| Ambient Relative Humidity:              | 45 – 55 %                                                                                     |
| Atmospheric Pressure:                   | 101 kPa                                                                                       |
|                                         |                                                                                               |

## 2 Summary

Table 1 Summary of results

| Test Case                              | FCC Part No.    | Requirements                                                                                                                                    | Result |
|----------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Cellular Band                          |                 |                                                                                                                                                 |        |
| Transmitter Output Power               | 2.1046 & 22.913 | ERP not exceed 7 W                                                                                                                              | Pass   |
| Modulation Characteristics             | 2.1047          | Digital modulation                                                                                                                              | Pass   |
| Occupied Bandwidth                     | 2.1049          | (Not specified)                                                                                                                                 | Pass   |
| Band Edges Compliance                  | 2.1051 & 917    | Below -13 dBm/1%*EBW, in 1 MHz range                                                                                                            | Pass   |
| Spurious Emission at Antenna Terminals | 2.1051 & 2.917  | Below -13 dBm/1 kHz, 9 kHz to 150 kHz<br>Below -13 dBm/10 kHz, 150 kHz to 30 MHz<br>Below -13 dBm/100 kHz, 30 MHz to 10 <sup>th</sup> harmonics | Pass   |
| Field Strength of Spurious Radiation   | 2.1053 & 22.917 | Below -13 dBm/100 kHz                                                                                                                           | Pass   |
| Frequency Stability                    | 2.1055 & 22.355 | Maintained within the tolerances of $\pm 2.5$ ppm                                                                                               | Pass   |

## 3 Product Description

### 3.1 Product Information

#### 3.1.1 General Description

HSDPA/HSUPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth U6020 is subscriber equipment in the WCDMA/GSM system. The UMTS frequency band includes Band I and Band II and Band IV. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only GSM850 band test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, UMTS and GSM/GPRS/EDGE protocol processing, voice, MMS service, AGPS etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

#### 3.1.2 Board Information

Table 2 Board Information

| HSDPA/HSUPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth |                                 |                  |
|------------------------------------------------------------|---------------------------------|------------------|
| U6020                                                      |                                 |                  |
| Board and Module                                           |                                 |                  |
| Description                                                | Software Version                | Hardware Version |
| Main board of Mobile Phone                                 | HUAWEI U6020<br>V100R001CCUB301 | Ver.B            |

#### 3.1.3 Adapter Technical Data

|                    |                               |
|--------------------|-------------------------------|
| AC/DCAdapter Model | HS-050040U6(02130875)         |
| Manufacturer       | Huawei Technologies Co., Ltd. |
| Input Voltage      | ~ 100-240V 50/60Hz            |
| Output Voltage     | ≡ 5.0 V                       |
| Rated Power        | 2W                            |

### 3.1.4 Battery Technical Data

| Name                | Manufacture                   | Description                                                                                                                                                                                                                                                                            |
|---------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rechargeable Li-ion | Huawei Technologies Co., Ltd. | Battery Model: HB5A2(24021106)<br>Rated capacity: 1000mAh<br>Nominal Voltage:  +3.7V<br>Charging Voltage:  +4.2V |

## 4 Test Description

### 4.1 Supported Frequency Range

| Characteristics | Description    |
|-----------------|----------------|
| Downlink        | 869 to 894 MHz |
| Uplink          | 824 to 849 MHz |

### 4.2 Transmitter / Receiver Characteristics

| Characteristics                    | Description                                                         |
|------------------------------------|---------------------------------------------------------------------|
| System Type                        | GSM                                                                 |
| TX Output Power (per Antenna Port) | GSM system: 33dBm                                                   |
| Channel Spacing(s) / Bandwidth(s)  | GSM system: 200 kHz                                                 |
| Designation of Emissions           | GSM system: 246KGXW (GMSK modulation),<br>243KG7W (8PSK modulation) |

### 4.3 Antenna Gain

|                   |       |
|-------------------|-------|
| Antenna Gain(dBi) | -1.85 |
| Antenna Gain(dBd) | -4.00 |

### 4.4 Power Supply

| Specification           | Description                                                                     |
|-------------------------|---------------------------------------------------------------------------------|
| Power Supply Type       | Directly Connected to DC /AC Power Supply                                       |
| Input to EUT (DC power) | DC Voltage Nominal: $\equiv$ 3.7 V<br>DC Voltage Range: $\equiv$ 3.5 V to 4.2 V |
| Input to EUT (AC power) | AC Voltage Nominal: ~ 120 V (50/60 Hz)<br>AC Voltage Range: ~100-240V           |

## 5 General Test Conditions / Configurations

### 5.1 RF Channels under Test

| Test Mode | TX / RX | RF Channel  |             |             |
|-----------|---------|-------------|-------------|-------------|
|           |         | Low (L)     | Middle (M)  | High (H)    |
| TM1/TM2   | TX      | Channel 128 | Channel 192 | Channel 251 |
|           |         | 824.2MHz    | 837.0MHz    | 848.8MHz    |
|           | RX      | Channel 128 | Channel 192 | Channel 251 |
|           |         | 869.2MHz    | 882.0MHz    | 893.8MHz    |

### 5.2 Test Modes

| Test Mode | Test Modes Description    |
|-----------|---------------------------|
| TM1       | GSM/GPRS, GMSK modulation |
| TM2       | EDGE, 8PSK modulation     |

### 5.3 Test Environment

| Environment Parameter | Selected Values During Tests |         |
|-----------------------|------------------------------|---------|
| Relative Humidity     | Ambient                      |         |
| Temperature           | TN                           | Ambient |
| Voltage               | VL                           | 3.5V    |
|                       | VN                           | 3.7V    |
|                       | VH                           | 4.2V    |

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

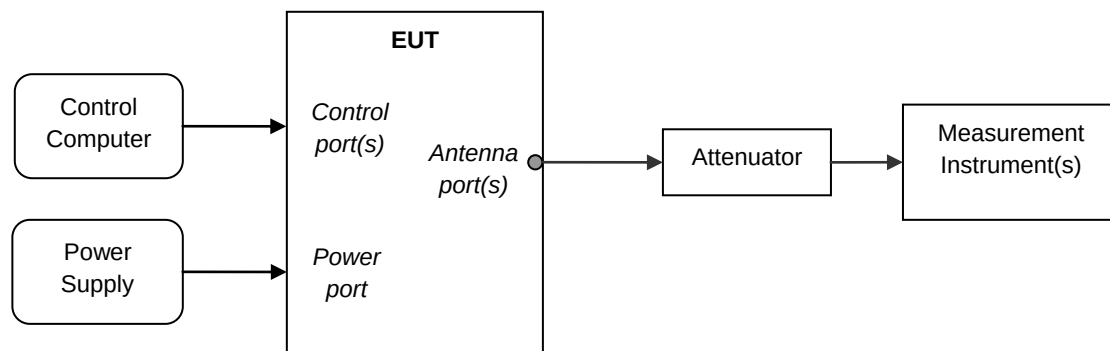
TN= normal temperature

## 5.4 Test Setup

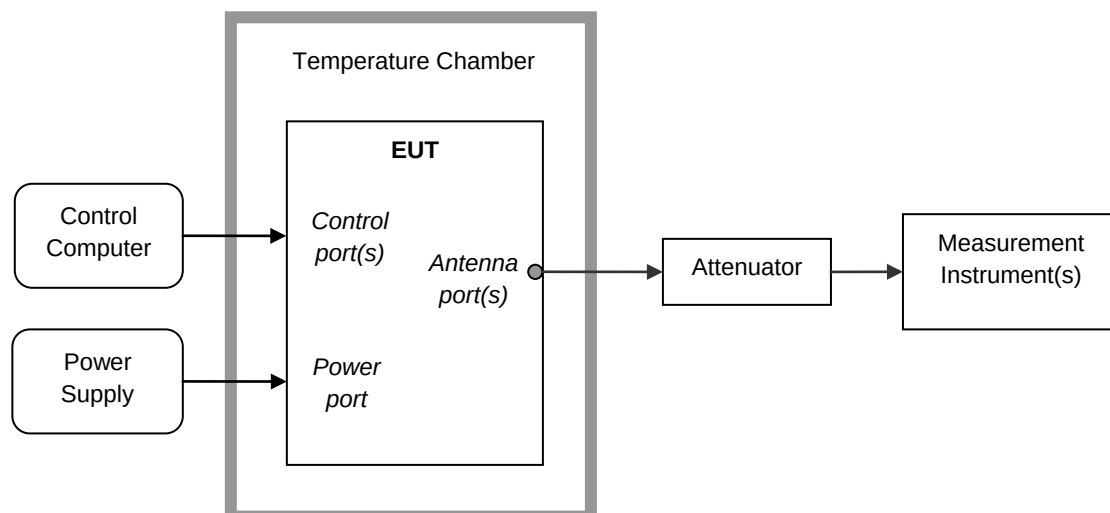
### 5.4.1 General Test Setup Configurations

| Configuration       | Description                                                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Antenna Ports  | Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT. |
| Multiple RF Sources | Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.                                                                                                                                       |

### 5.4.2 Test Setup 1



### 5.4.3 Test Setup 2



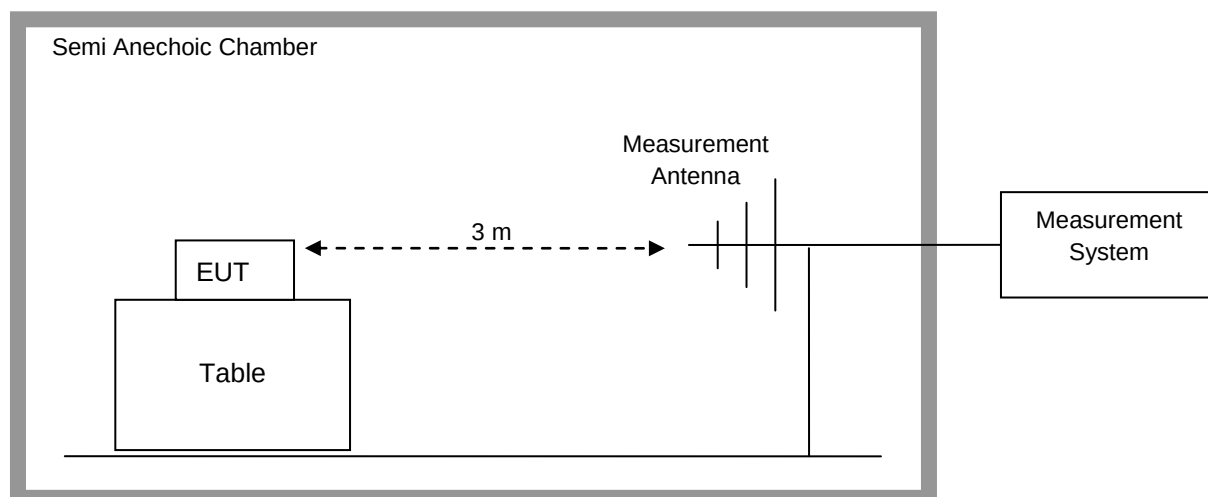
#### 5.4.4 Test Setup 3

NOTE1: Effective radiated power (ERP) or Effective Isotropic radiated power (EIRP) refers to the EUT radiation power output, assuming all emissions are radiated from half-wave dipole antennas horn antennas.

NOTE2: The EUT was set on insulator 80cm above the Ground Plane. The setup and test methods were according to ANSI-TIA-603C 2004. The measurements were carried through with a Rohde and Schwarz Test Receiver and control software.

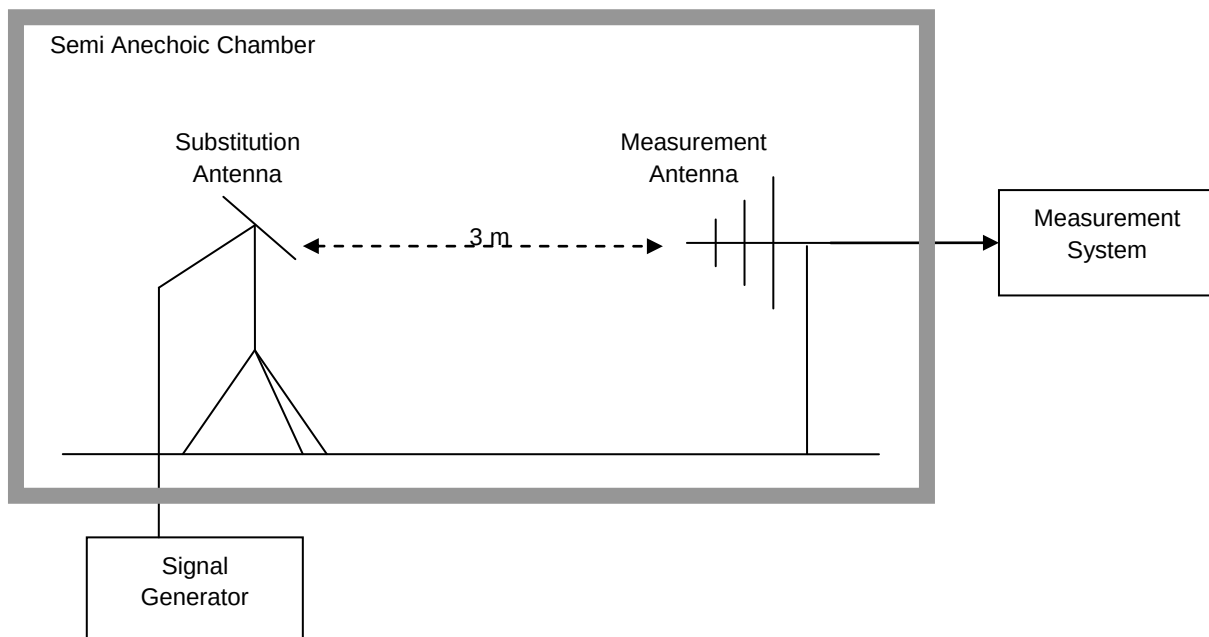
##### Step 1: Pre-test to find the Maximum ERP or EIRP

1. Connect the test system according to the following figure. EUT is running for 30 minutes before test, and measurement instruments are warming-up for 30 minutes.
2. Set up communication link between Universal radio communication tester and EUT, set EUT working frequency, and control EUT to transmit at maximum power.
3. Set the center frequency of the signal analyzer or receiver to the EUT's operating frequency; the RBW is equal to the emission bandwidth of the signal. Set RMS detector for the test, and the span is equal to 2 times of emission bandwidth, the other settings should remain automatic. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°. The receiver antenna has two polarizations V and H. A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other non-metallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized. Measure the EUT maximum RF power and record the result.
4. Changing EUT working frequency and measuring the RF power at channel L, M, H respectively.  
Complete the test data.



## Step 2: Substitution method to verify the maximum ERP or EIRP

1. Measurement setup is according to the following figure. EUT was substituted by antenna, and the polarization is identical with the test antenna; the signal generator was connected to the substitution antenna.
2. The radiated output power, measured by signal analyzer set, is the same as recorded in above item 5). Then this power level is matched by a signal from a calibrated signal generator which is substituted for EUT. The power supplied by the generator is then equal to the ERP or EIRP after corrected by the antenna gain and cable loss.



## 5.5 Test Conditions

| Test Case                              | Test Conditions    |                                                                                                                           |
|----------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------|
| Transmitter Output Power               | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1 & Test Setup 3                                                                                               |
|                                        | Detector           | RMS                                                                                                                       |
|                                        | RBW                | > emission bandwidth                                                                                                      |
|                                        | VBW                | 3*RBW                                                                                                                     |
|                                        | RF Channels (TX)   | L, M, H                                                                                                                   |
|                                        | Test Mode          | TM1/TM2                                                                                                                   |
| Modulation Characteristics             | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | RF Channels (TX)   | M                                                                                                                         |
|                                        | Test Mode          | TM1/TM2                                                                                                                   |
| Occupied Bandwidth                     | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | Detector           | PK                                                                                                                        |
|                                        | RF Channels (TX)   | L, M, H                                                                                                                   |
|                                        | Test Mode          | TM1/TM2                                                                                                                   |
| Band Edges Compliance                  | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | Detector           | RMS                                                                                                                       |
|                                        | RF Channels (TX)   | L, H                                                                                                                      |
|                                        | Test Mode          | TM1/TM2                                                                                                                   |
| Spurious Emission at Antenna Terminals | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | Detector           | PK                                                                                                                        |
|                                        | RF Channels (TX)   | L, M, H                                                                                                                   |
|                                        | Test Mode          | TM1/TM2                                                                                                                   |
| Field Strength of Spurious Radiation   | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 3                                                                                                              |
|                                        | Detector           | PK                                                                                                                        |
|                                        | RF Channels (TX)   | M                                                                                                                         |
|                                        | Test Mode          | TM1/TM2                                                                                                                   |
| Frequency Stability                    | Test Configuration | (1) -30 °C to +50 °C with step 10 °C at Rated Voltage;<br>(2) 85%, 100% and 115% of Rated Voltage at Ambient Temperature. |



| Test Case | Test Conditions  |              |
|-----------|------------------|--------------|
|           | Test Setup       | Test Setup 2 |
|           | RF Channels (TX) | M            |
|           | Test Mode        | TM1/TM2      |

## 6 Main Test Instruments

Table 3 Main Test Equipments

| Equipment Description                           | Manufacturer | Model     | Serial Number | Calibrated until |
|-------------------------------------------------|--------------|-----------|---------------|------------------|
| Power supply                                    | KEITHLEY     | 2303      | 1288003       | Sep.27,2012      |
| Universal Radio Communication Tester            | R&S          | CMU200    | 117341        | Jan.12.2013      |
| Universal Radio Communication Tester            | Agilent      | E5515C    | MY50260239    | Aug.31,2012      |
| Spectrum Analyzer                               | Agilent      | E4440A    | MY49420179    | Jul.17,2012      |
| Signal Analyzer                                 | R&S          | FSQ31     | 200021        | Sep.27,2012      |
| Temperature Chamber                             | WEISS        | WKL64     | 24600294      | Feb.13,2013      |
| Signal generator                                | Agilent      | E8257D    | MY49281095    | Jul.09.2012      |
| Spectrum analyzer                               | R&S          | FSU3      | 200474        | Mar., 05, 2013   |
| Spectrum analyzer                               | R&S          | FSU43     | 100144        | Mar., 05, 2013   |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S          | HF907     | 100304        | Apr., 05, 2013   |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S          | HF907     | 100391        | Apr., 05, 2013   |
| Trilog Broadband Antenna (30M~3GHz)             | SCHWARZBECK  | VULB 9163 | 9163-521      | Jul., 07, 2012   |
| Pyramidal Horn Antenna(26GHz-40GHz)             | ETS-Lindgren | 3160-10   | 00123940      | Feb., 27, 2013   |
| Pyramidal Horn Antenna(18GHz-26.5GHz)           | ETS-Lindgren | 3160-09   | 00125912      | Feb.,27, 2013    |

Note: All the equipments are calibrated once a year. When it's almost due, we will arrange calibration again before the calibration deadline.

## 7 Test Results

| No. | Test Item                              | Test Result |
|-----|----------------------------------------|-------------|
| 1   | Transmitter Output Power               | Appendix A  |
| 2   | Modulation Characteristics             | Appendix B  |
| 3   | Occupied Bandwidth                     | Appendix C  |
| 4   | Band Edges Compliance                  | Appendix D  |
| 5   | Spurious Emission at Antenna Terminals | Appendix E  |
| 6   | Radiated Spurious Radiation            | Appendix F  |
| 7   | Frequency Stability                    | Appendix G  |
| 8   | Photos of Radiated Spurious Radiation  | Appendix H  |

NOTE: There is no test data in Appendix H, only Photos of Test Setup for Field Strength of Spurious Radiation.

## 8 Measurement Uncertainty

For a 95% confidence level ( $k=2$ ), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

| Test Item                            |                          | Extended Uncertainty                               |
|--------------------------------------|--------------------------|----------------------------------------------------|
| Transmitter Output Power             | Power (dBm)              | U =0.39 dB                                         |
| Occupied Bandwidth                   | Magnitude (%)            | U=0.2%                                             |
| Band Edge Compliance                 | Disturbance Power (dBm)  | U=2.0 dB                                           |
| Conducted Spurious Emissions         | Disturbance Power (dBm)  | U=2.0 dB                                           |
| Field Strength of Spurious Radiation | ERP (dBm)                | U=4.6 dB (30 MHz – 1GHz)<br>U=3.0 dB (above 1 GHz) |
| Frequency Stability                  | Frequency Accuracy (ppm) | U=0.21 ppm                                         |

-----The END-----



## **Appendix A**

# Transmitter Output Power

According to FCC Part 2.1046 & Part 22.913



## Conducted Power of Transmitter

| TEST CONDITIONS     | RF Output Power (Conducted) |       |               |       |               |       |
|---------------------|-----------------------------|-------|---------------|-------|---------------|-------|
|                     | Channel128(B)               |       | Channel192(M) |       | Channel251(T) |       |
|                     | 824.2MHz                    |       | 837.0MHz      |       | 848.8MHz      |       |
|                     | dBm                         |       | dBm           |       | dBm           |       |
| $T_{nom} / V_{nom}$ | Measured                    | Limit | Measured      | Limit | Measured      | Limit |
| TM1                 | 32.58                       | 38.5  | 32.57         | 38.5  | 32.78         | 38.5  |
| TM2                 | 26.71                       | 38.5  | 26.61         | 38.5  | 26.59         | 38.5  |

Note: RBW > emission bandwidth, VBW > 3 x RBW.



## Peak-to-Average Ratio

Table 1 Measurement Results

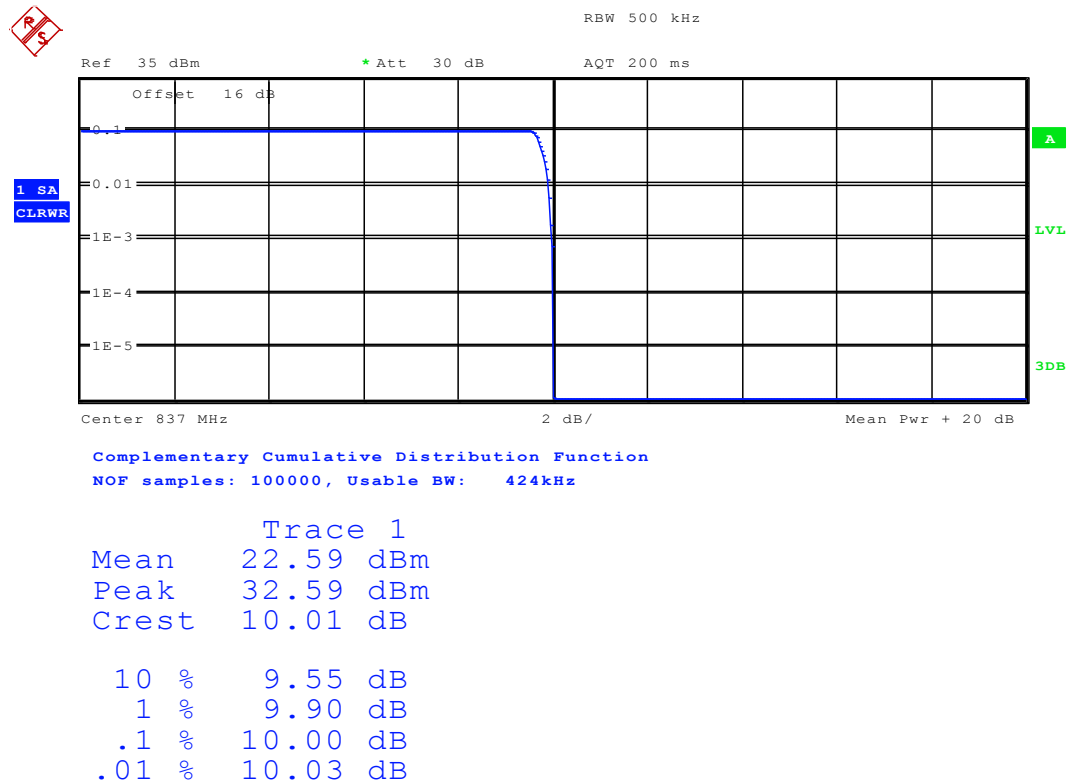
| TEST CONDITIONS     | Channel128(B) |       | Channel192(M) |       | Channel251(T) |       |
|---------------------|---------------|-------|---------------|-------|---------------|-------|
|                     | 824.2MHz      |       | 837.0MHz      |       | 848.8MHz      |       |
|                     | dBm           |       | dBm           |       | dBm           |       |
| $T_{nom} / V_{nom}$ | Measured      | Limit | Measured      | Limit | Measured      | Limit |
| TM1                 | 9.35          | 13.0  | 10.00         | 13.0  | 9.65          | 13.0  |
| TM2                 | 11.89         | 13.0  | 12.88         | 13.0  | 12.56         | 13.0  |



## Test Plot of Peak-to-Average Ratio

Note: All relevant operation modes have been tested, and the worst case Plot is included in this report.

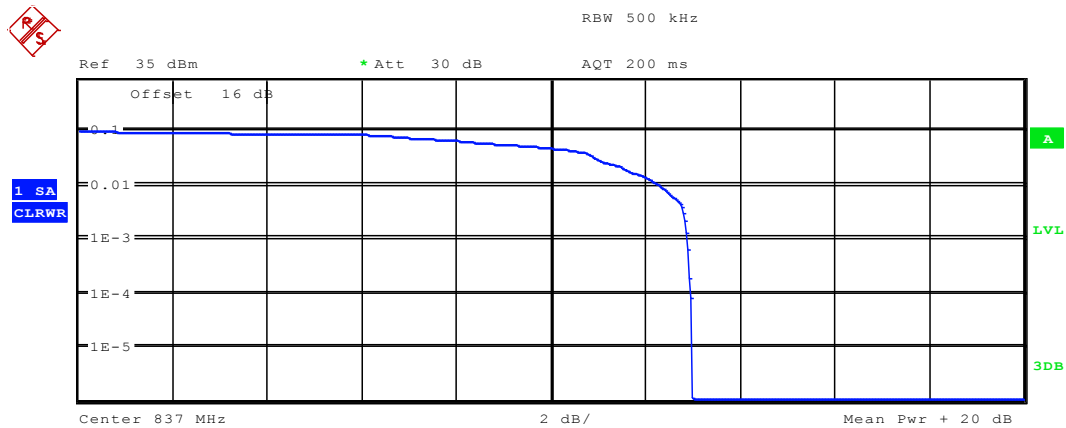
### TM1



Date: 27.JUN.2012 00:30:44



## TM2



Complementary Cumulative Distribution Function  
NOF samples: 100000, Usable BW: 424kHz

Trace 1

|       |       |     |
|-------|-------|-----|
| Mean  | 16.71 | dBm |
| Peak  | 29.70 | dBm |
| Crest | 12.99 | dB  |
| 10 %  | 1.86  | dB  |
| 1 %   | 12.31 | dB  |
| .1 %  | 12.88 | dB  |
| .01 % | 12.98 | dB  |

Date: 27.JUN.2012 00:33:48



## Effective Radiated Power of Transmitter (ERP)

| Test Mode | Freq. [MHz] | Meas. Level [dBm] | Substitution Antenna Type | SGP   | Substitution Gain [dBd] | Cable Loss [dB] | Substitution Level (ERP) | FCC limit [dBm] | Result |
|-----------|-------------|-------------------|---------------------------|-------|-------------------------|-----------------|--------------------------|-----------------|--------|
|           |             |                   |                           | [dBm] |                         |                 | [dBm]                    |                 |        |
| TM1       | 824.2       | 28.58             | Dipole Ant.               | 31.90 | -2.75                   | 0.6             | 28.55                    | 38.5            | Pass   |
| TM1       | 837.0       | 28.57             | Dipole Ant.               | 32.03 | -2.87                   | 0.6             | 28.56                    | 38.5            | Pass   |
| TM1       | 848.8       | 28.78             | Dipole Ant.               | 32.21 | -2.85                   | 0.6             | 28.76                    | 38.5            | Pass   |
| TM2       | 824.2       | 22.71             | Dipole Ant.               | 26.08 | -2.75                   | 0.6             | 22.73                    | 38.5            | Pass   |
| TM2       | 837.0       | 22.61             | Dipole Ant.               | 26.12 | -2.87                   | 0.6             | 22.65                    | 38.5            | Pass   |
| TM2       | 848.8       | 22.59             | Dipole Ant.               | 26.03 | -2.85                   | 0.6             | 22.58                    | 38.5            | Pass   |

Note: a, For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b, SGP=Signal Generator Level

Note2: RBW > emission bandwidth, VBW > 3 x RBW.

-----The END-----  
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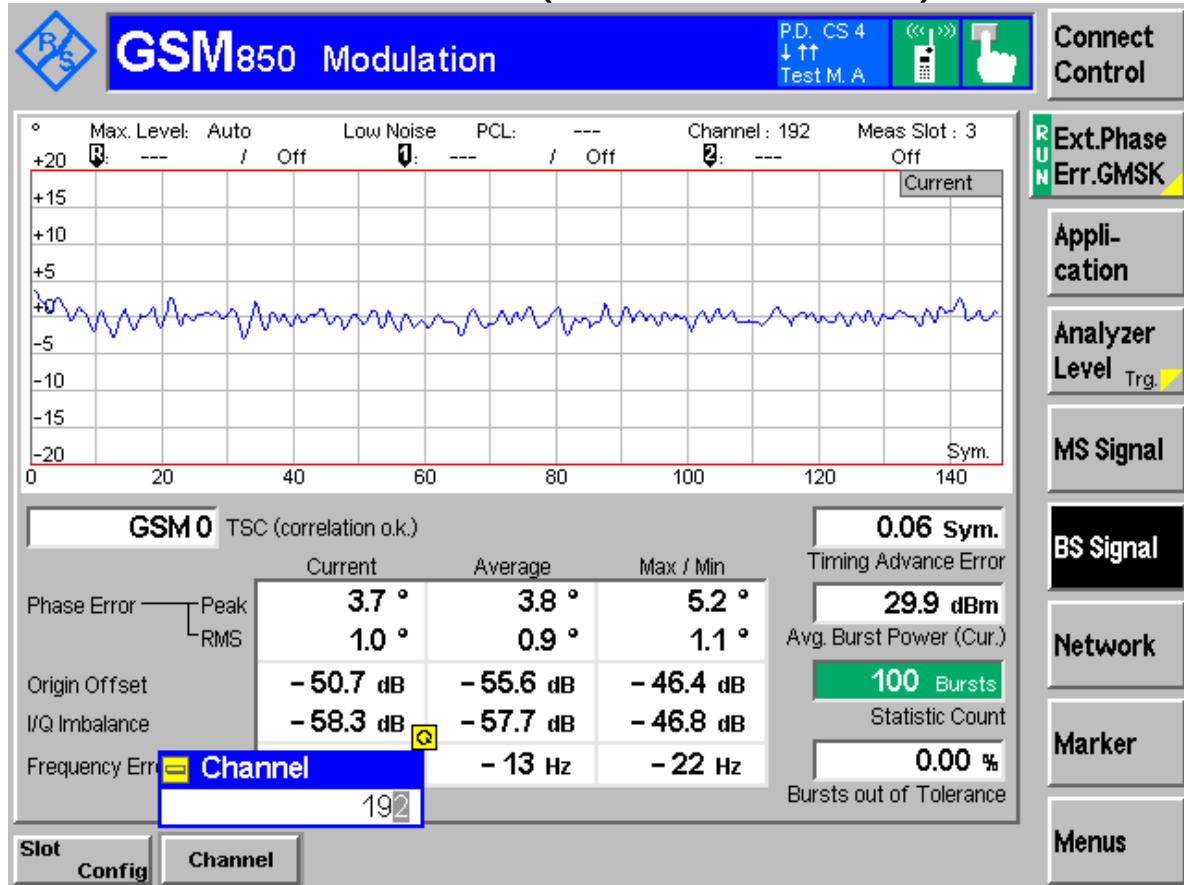
## **Appendix B**

# Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

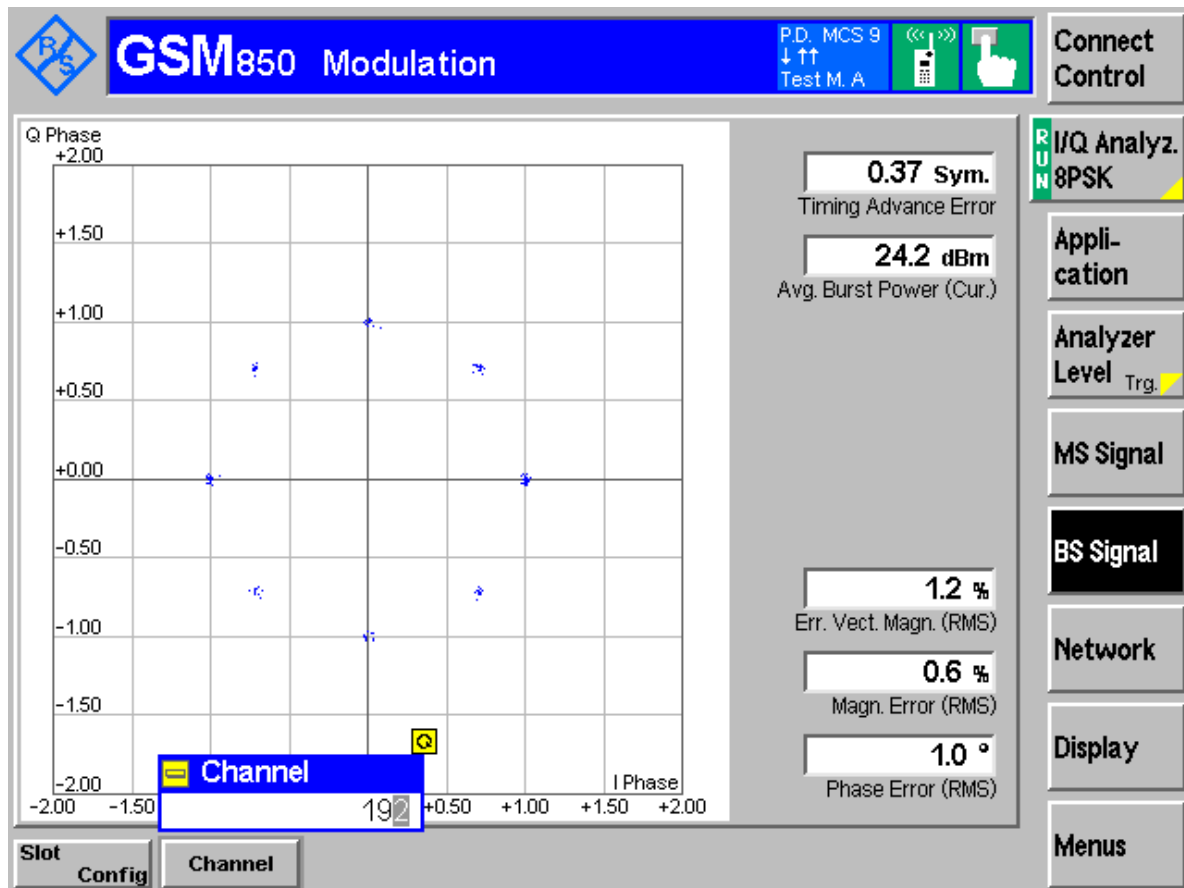


## Channel 192(TM1:GPRS/GSM)





## Channel 192(TM2:EDGE)



-----The END-----

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## Appendix C

### Occupied Bandwidth According to FCC Part 2.1049 & Part 22 Subpart H



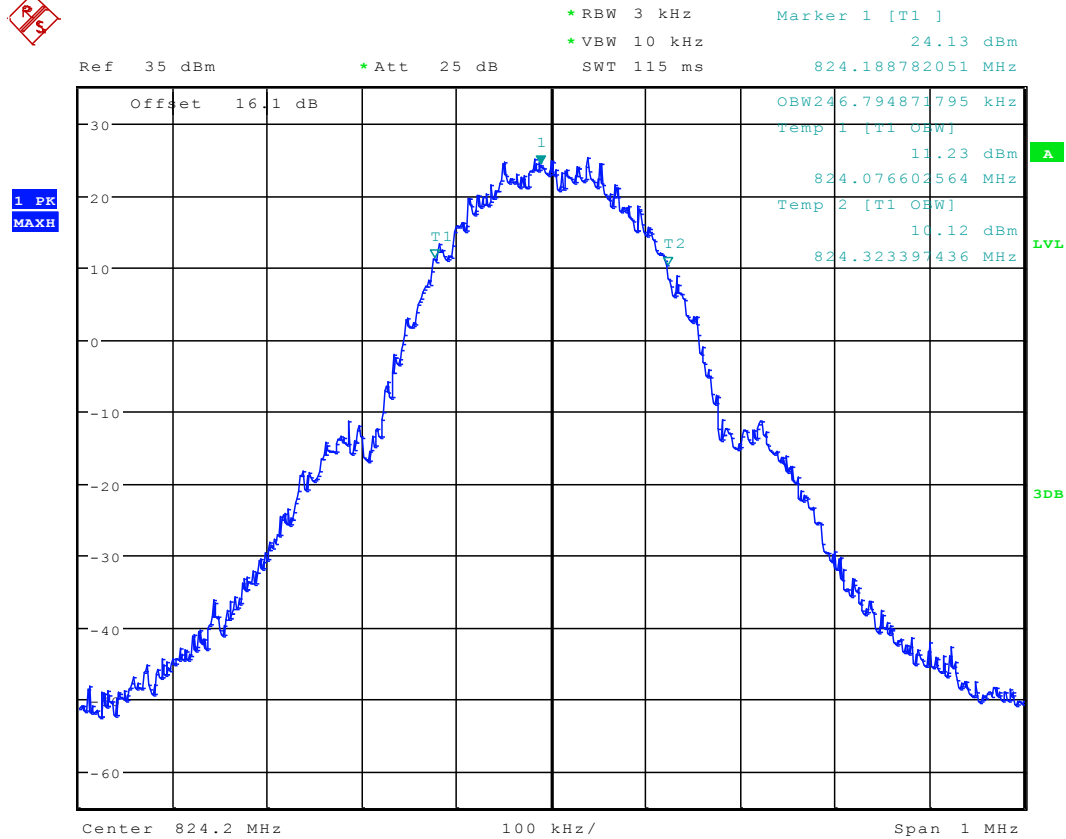
## Result Table

Table 1 Measurement Results

| Test Mode | RF Channel | Occupied Bandwidth [kHz] | Verdict |
|-----------|------------|--------------------------|---------|
| TM1       | 128        | 246.79                   | Pass    |
|           | 192        | 245.12                   | Pass    |
|           | 251        | 246.79                   | Pass    |
| TM2       | 128        | 243.59                   | Pass    |
|           | 192        | 237.18                   | Pass    |
|           | 251        | 245.19                   | Pass    |



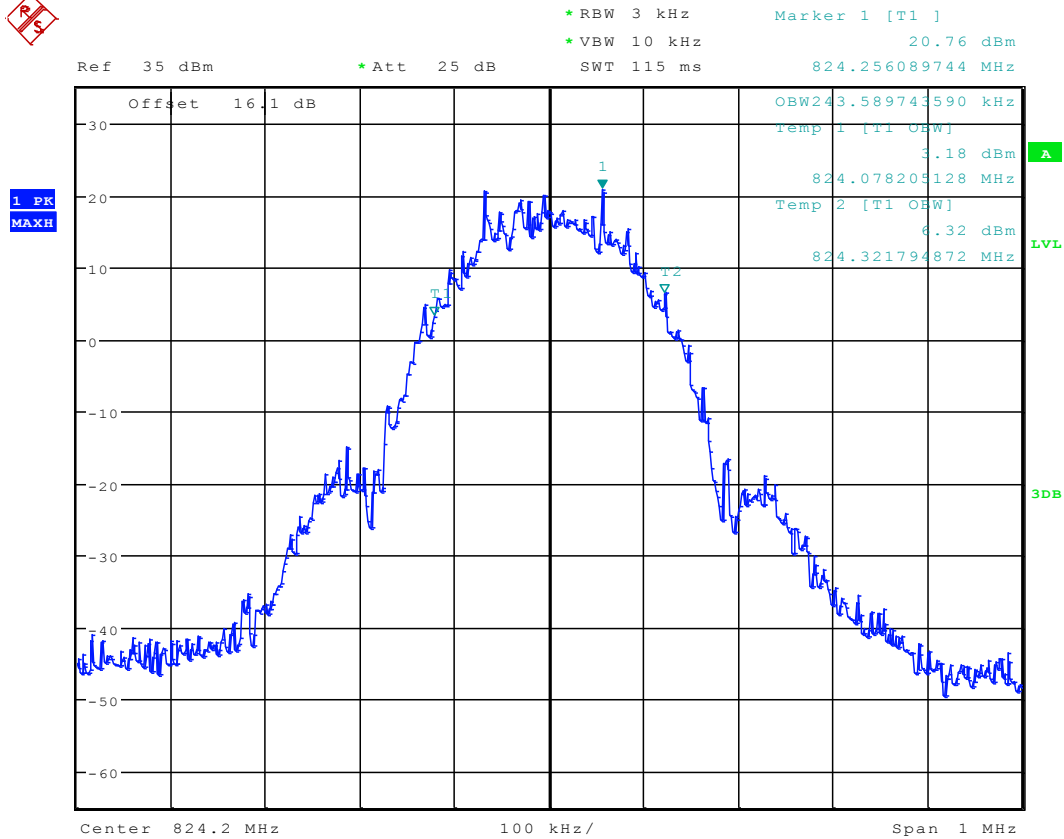
## Channel 128 (TM1:GPRS/GSM)



Date: 27.JUN.2012 01:37:20



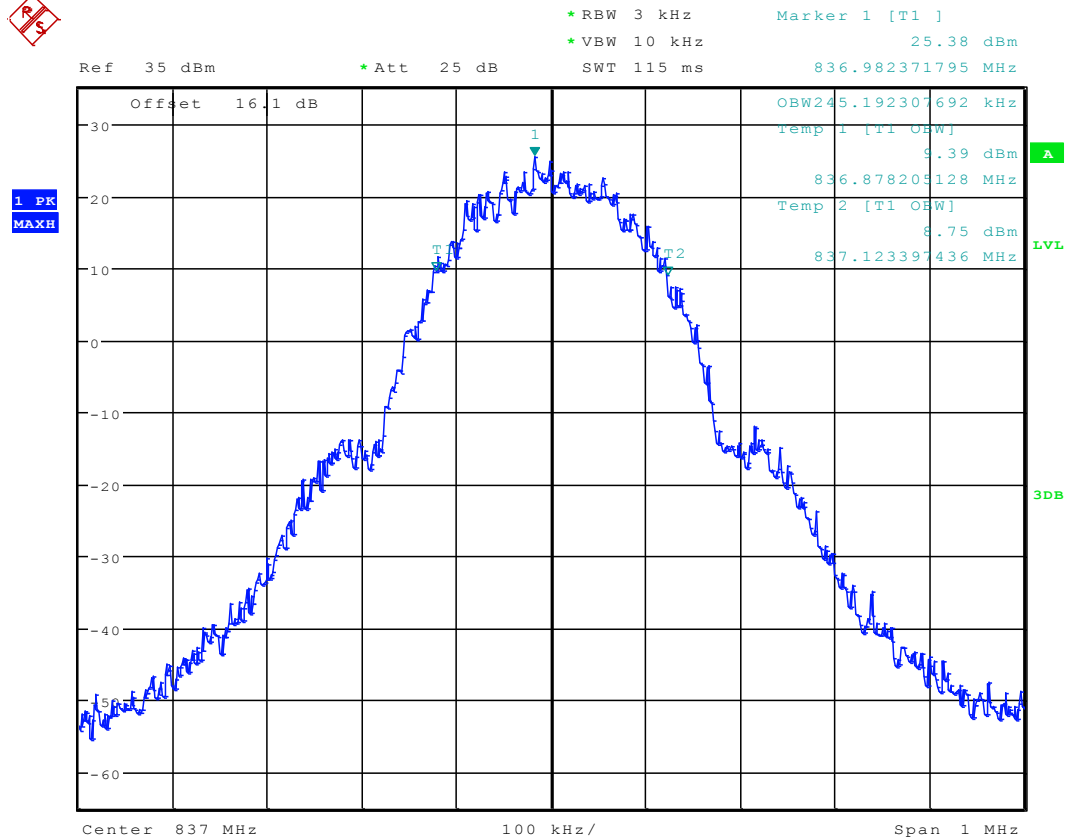
## Channel 128 (TM2:EDGE)



Date: 27.JUN.2012 01:42:17



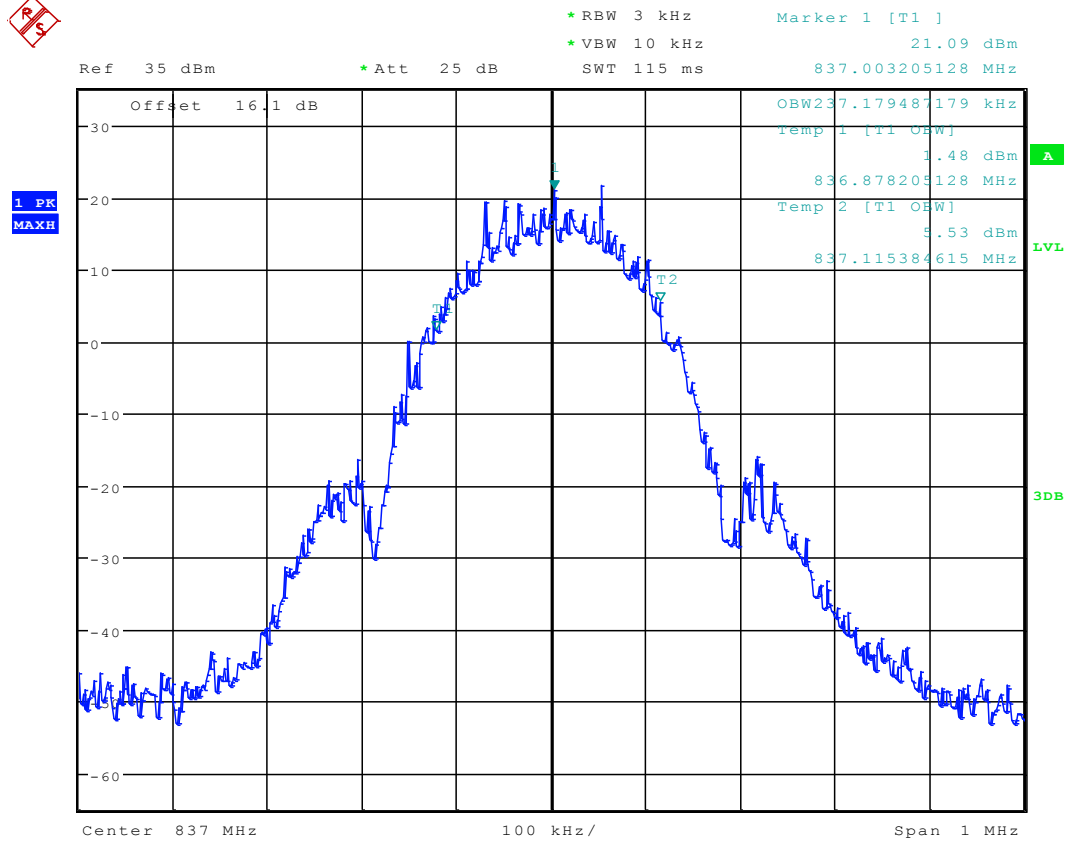
## Channel 192 (TM1:GPRS/GSM)



Date: 27.JUN.2012 01:38:05



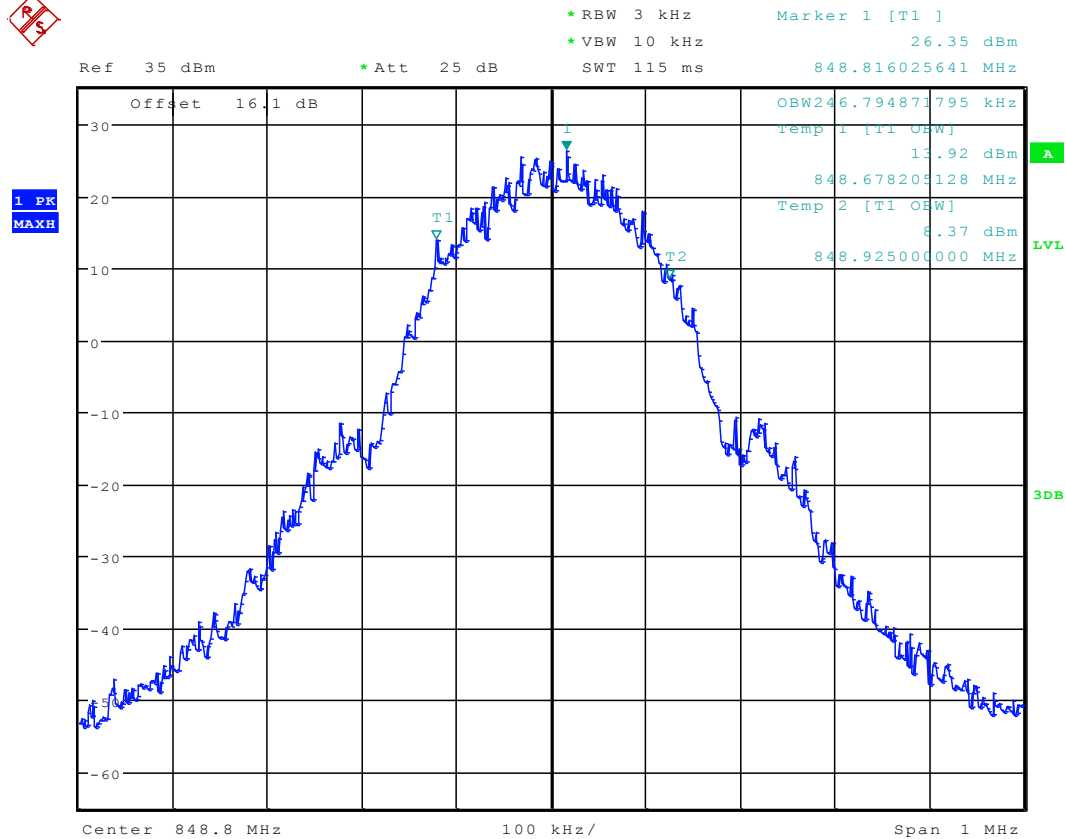
## Channel 192 (TM2:EDGE)



Date: 27.JUN.2012 01:41:22



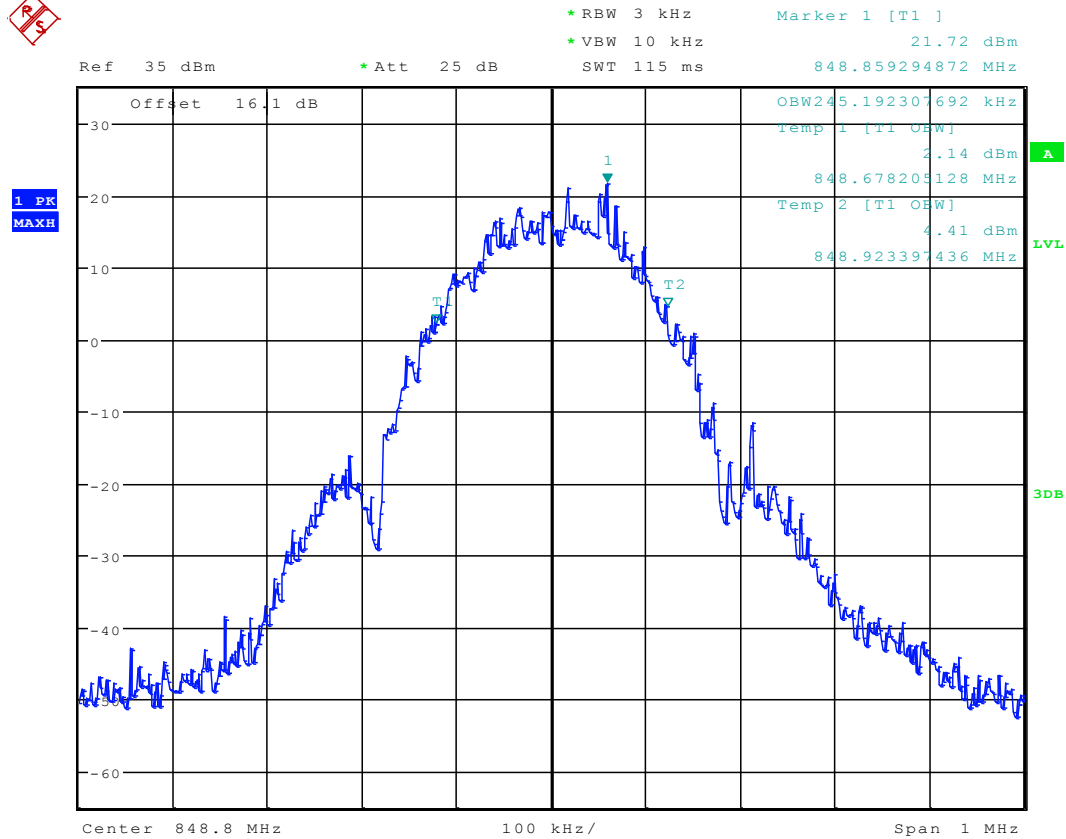
## Channel 251 (TM1:GPRS/GSM)



Date: 27.JUN.2012 01:38:45



## Channel 251 (TM2:EDGE)



Date: 27.JUN.2012 01:40:50

-----The END-----



## **Appendix D**

### **Band Edges Compliance**

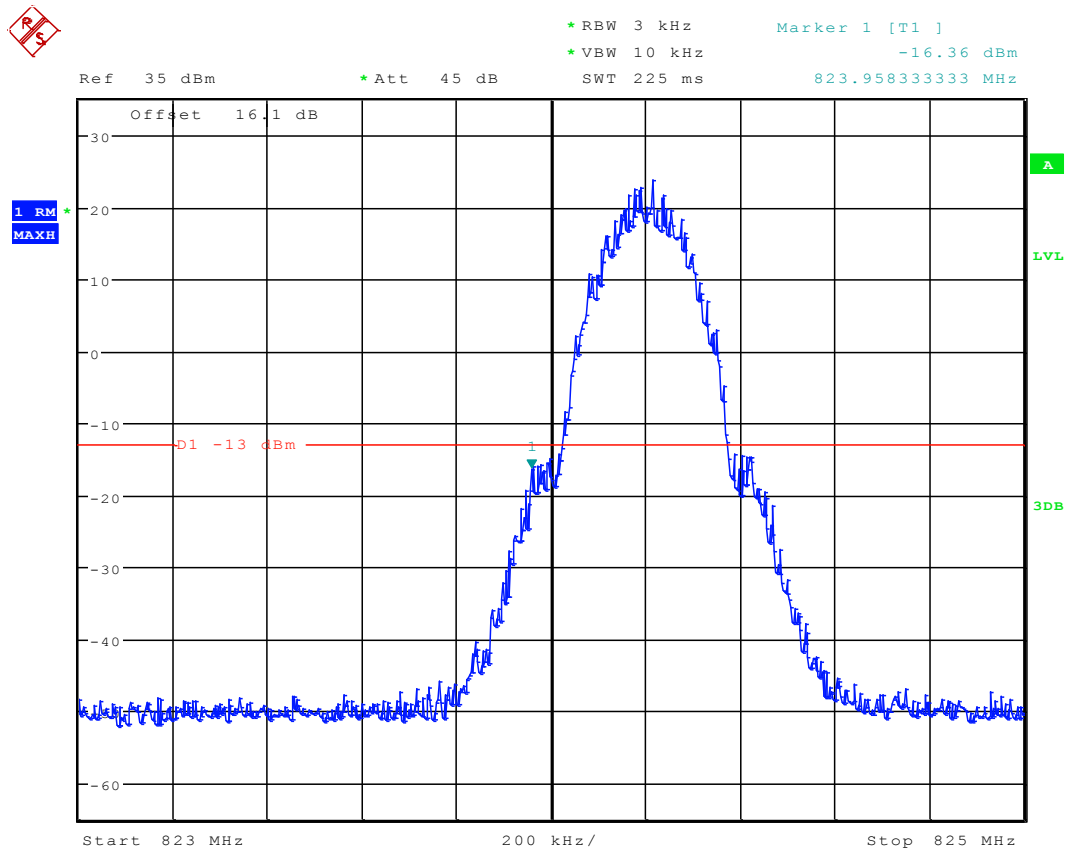
According to FCC Part 2.1051 & Part 22 Subpart H



# TM1:GPRS/GSM

## Left Edge

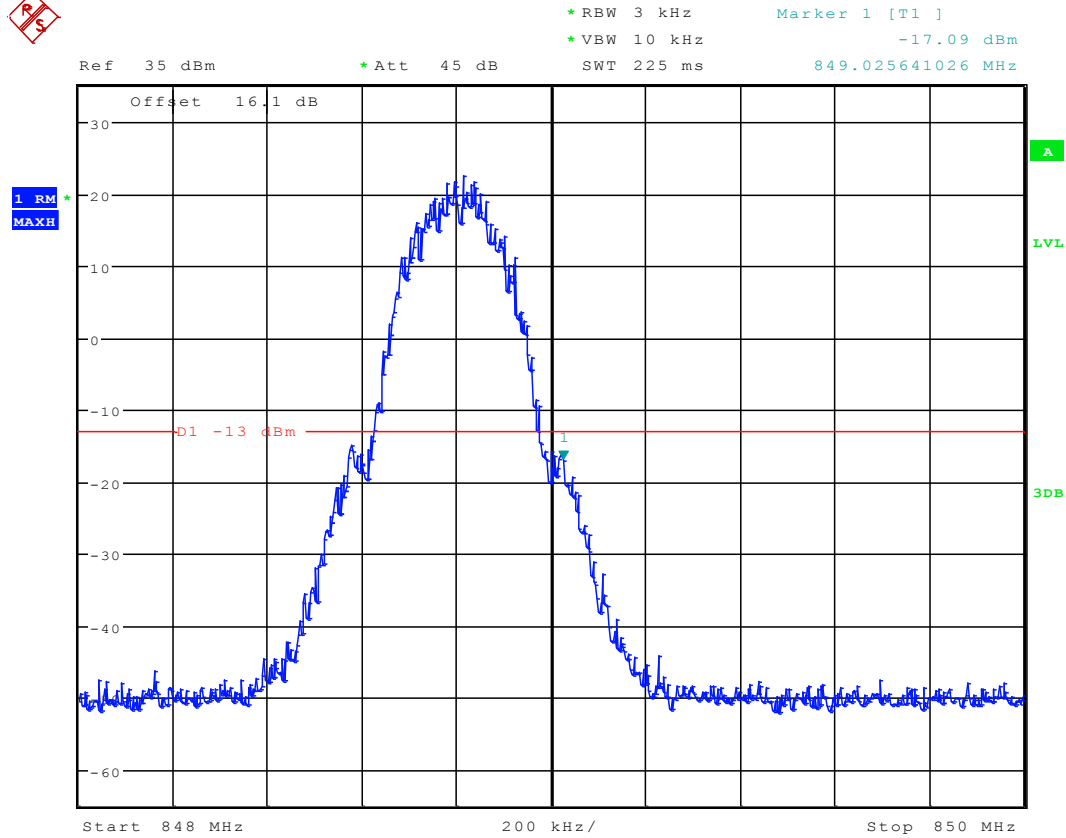
### Channel 128



Date: 27.JUN.2012 02:23:19



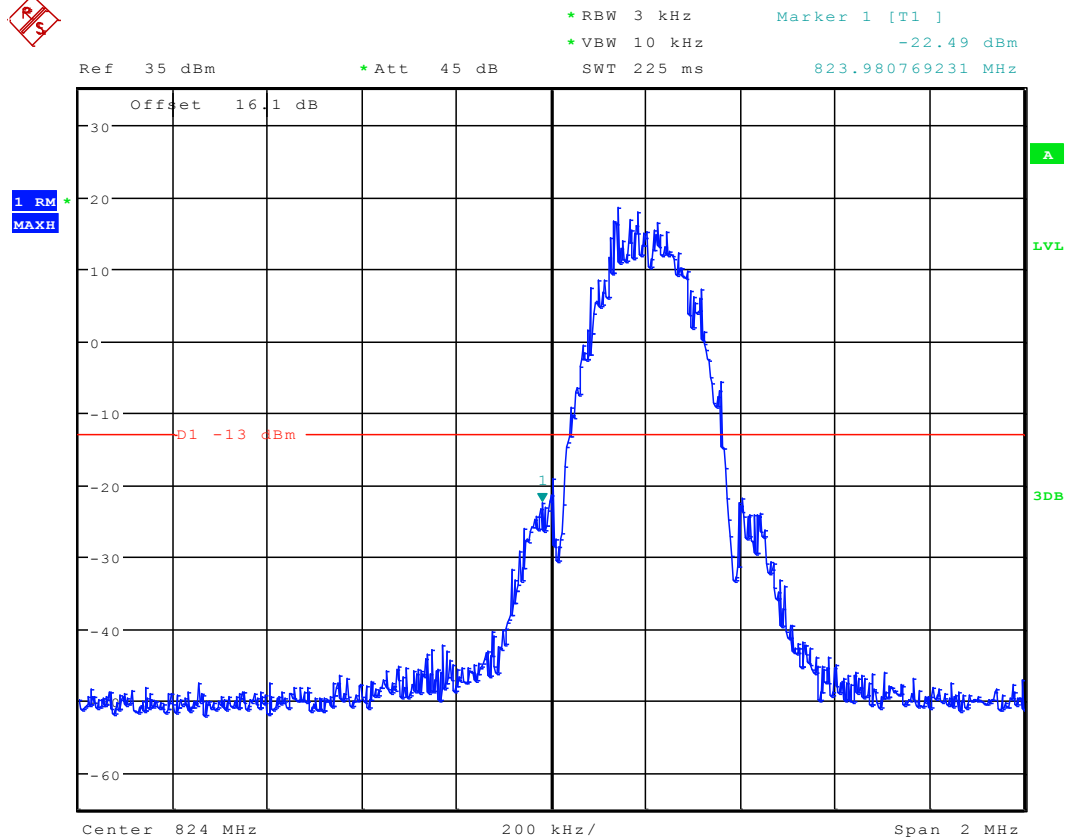
## Right Edge Channel 251



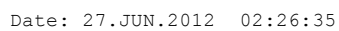
Date: 27.JUN.2012 02:24:04



## TM2:EDGE Left Edge Channel 128



Date: 27.JUN.2012 02:27:09



-----The END-----



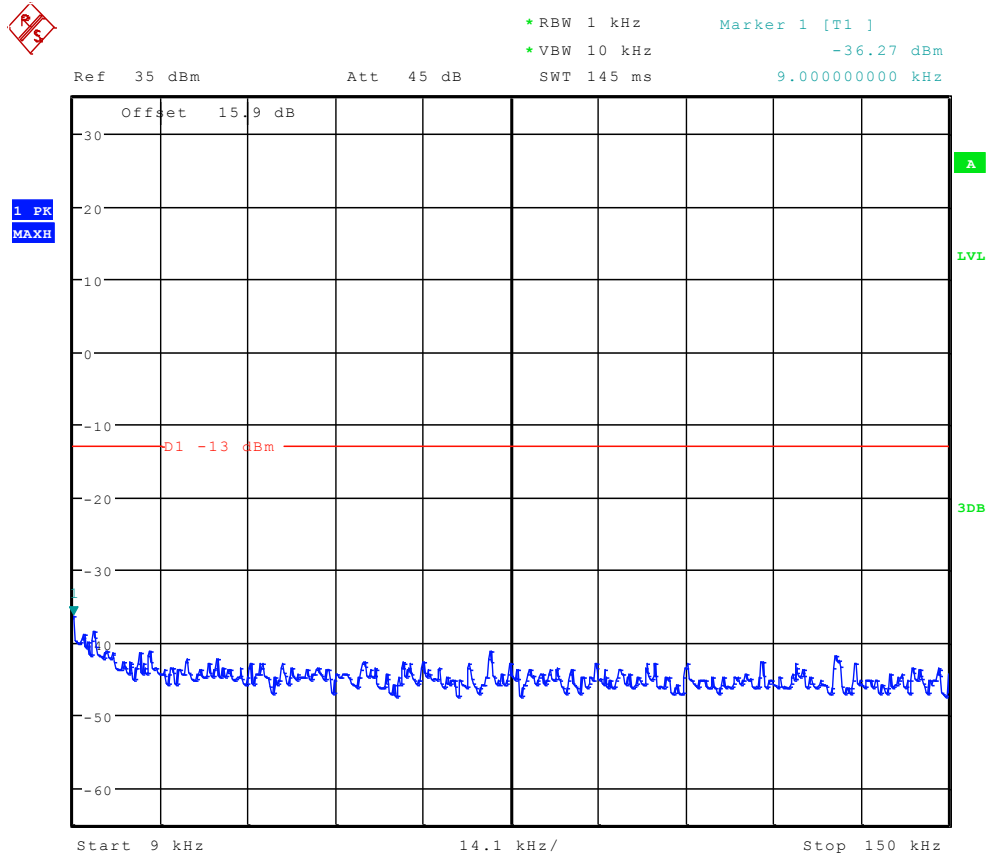
## **Appendix E**

# Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & Part 22 Subpart H



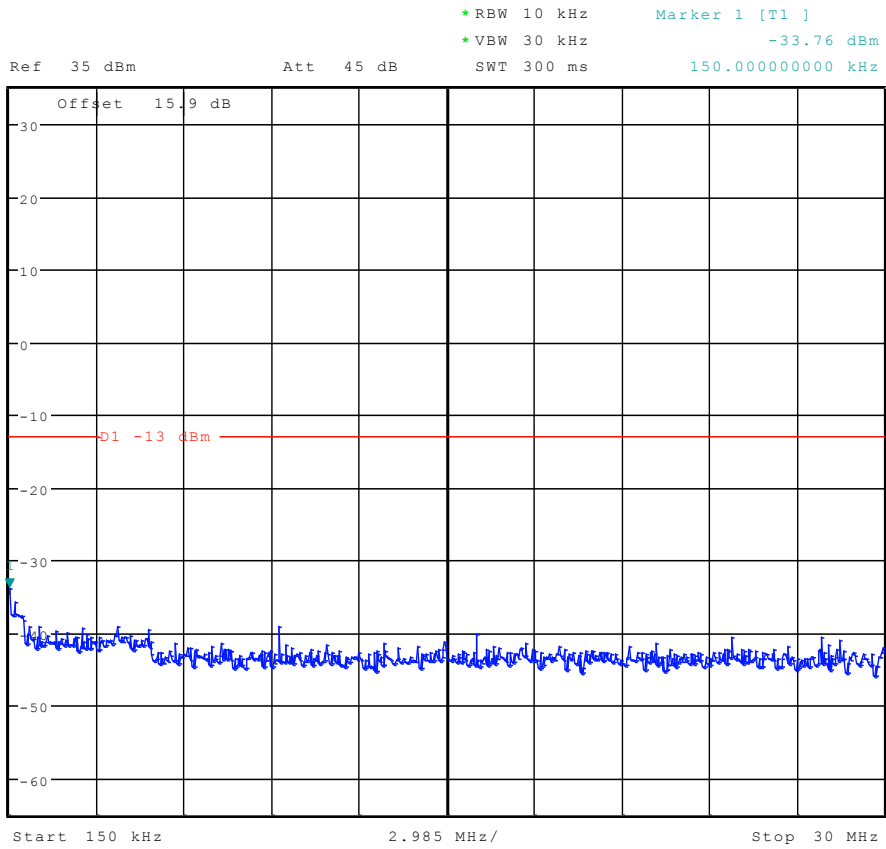
## TM1:GPRS/GSM Channel 128



Date: 28.JUN.2012 21:31:59



1 PK  
MAXH

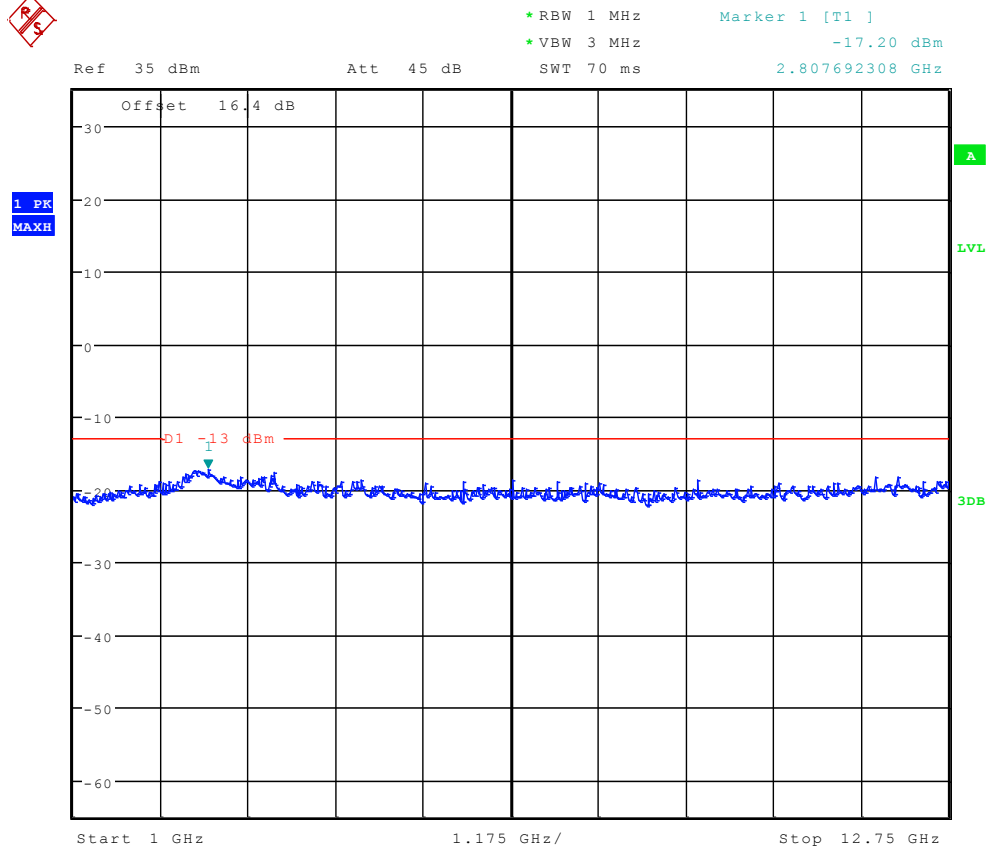


Date: 28.JUN.2012 21:32:42



Ref 35 dB Att 45 dB SWT 100 ms 825.897435897 MHz

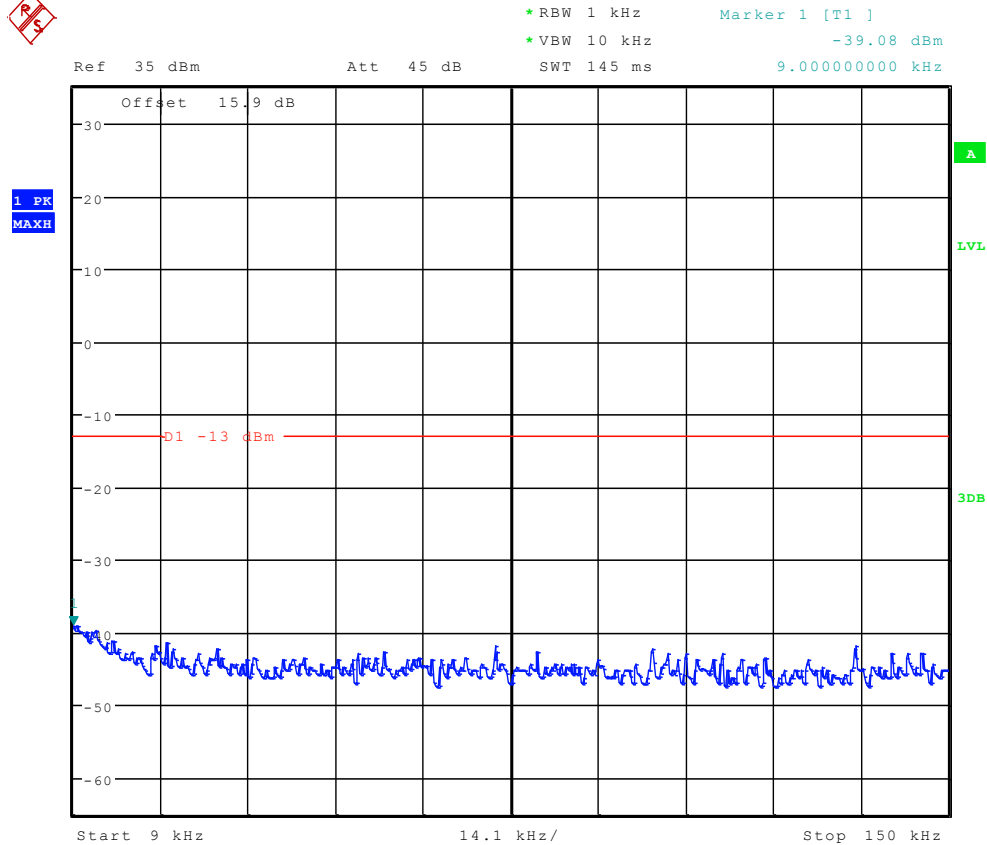




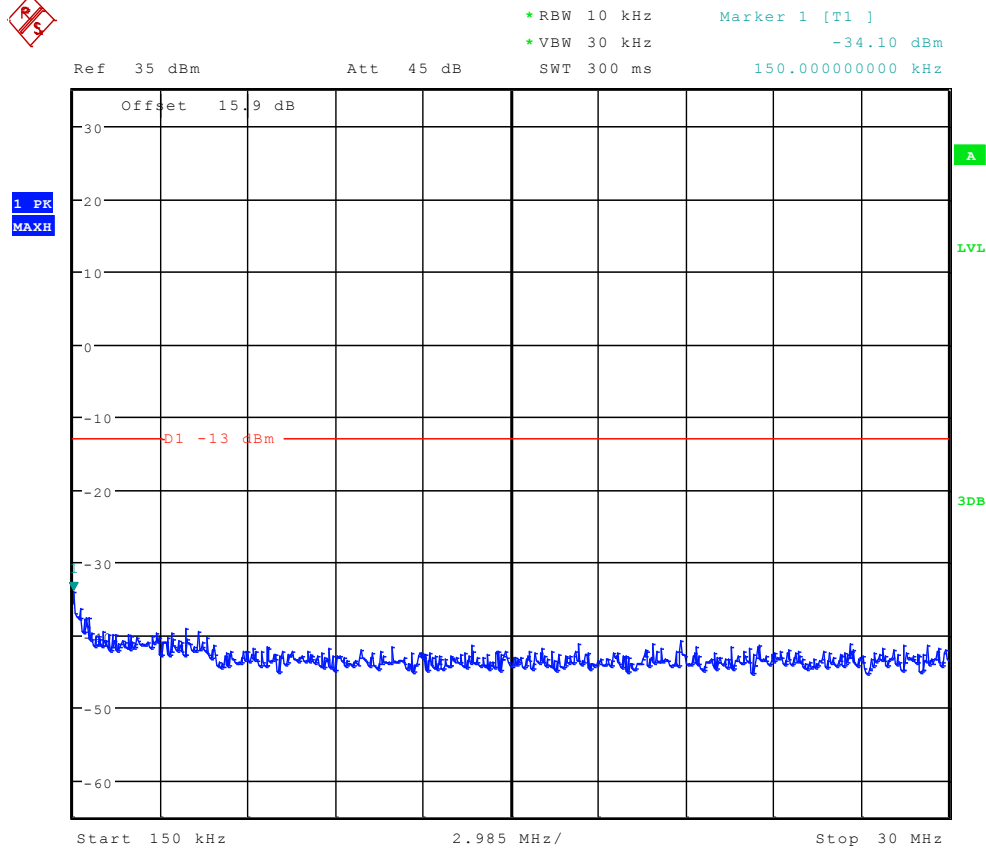
Date: 28.JUN.2012 21:34:10



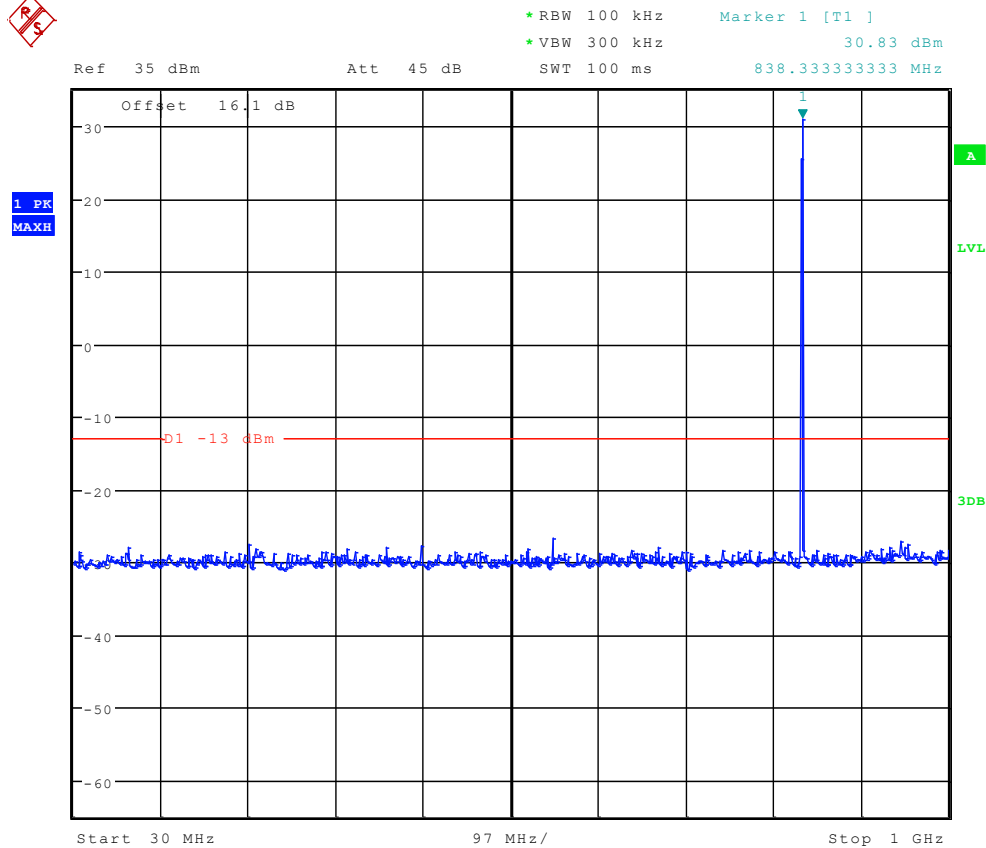
## Channel 192



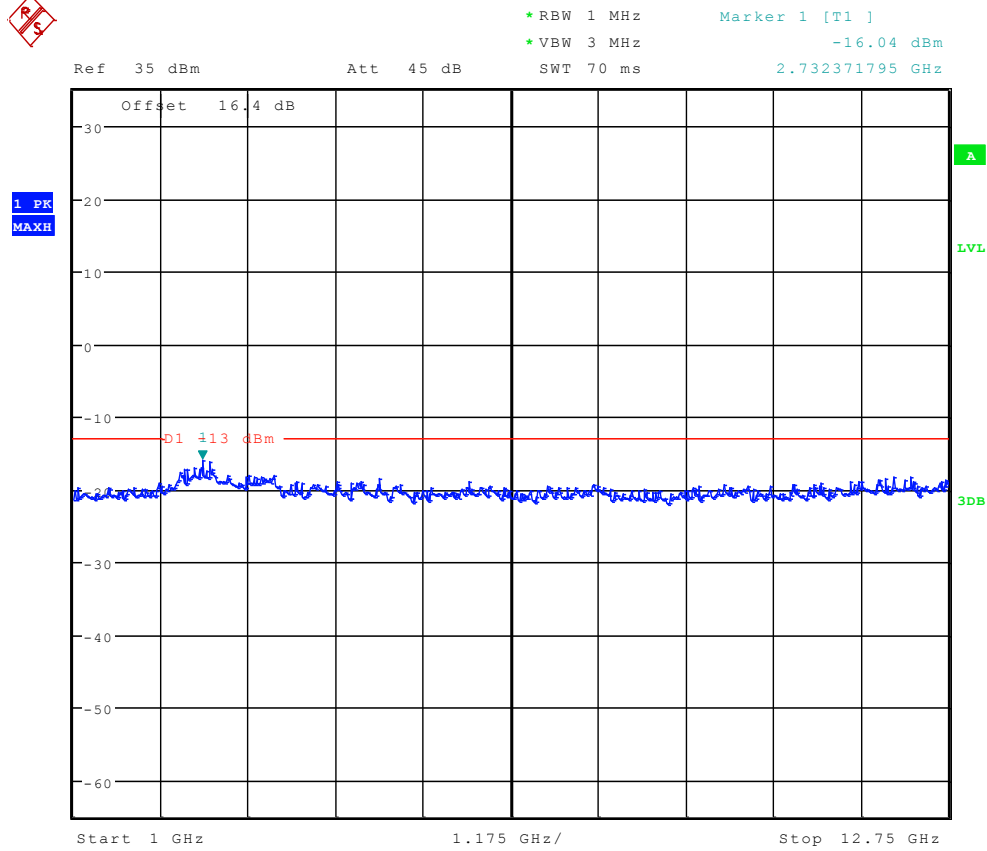
Date: 28.JUN.2012 21:32:13



Date: 28.JUN.2012 21:32:57



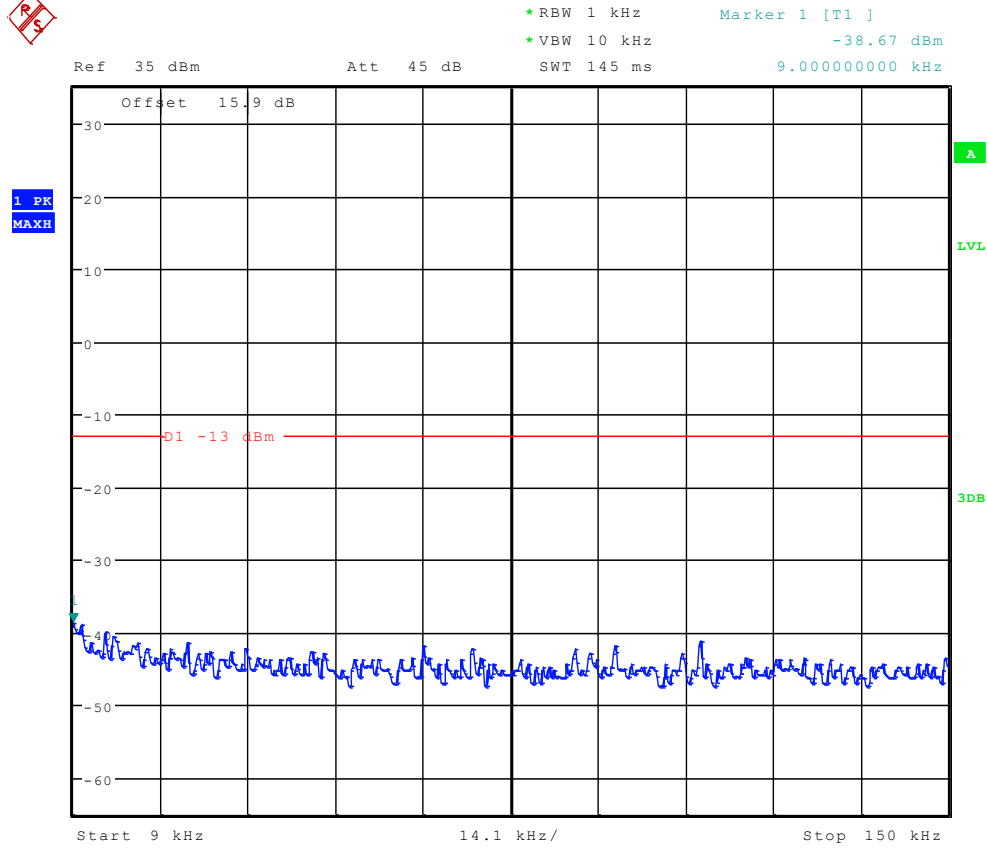
Date: 28.JUN.2012 21:33:41



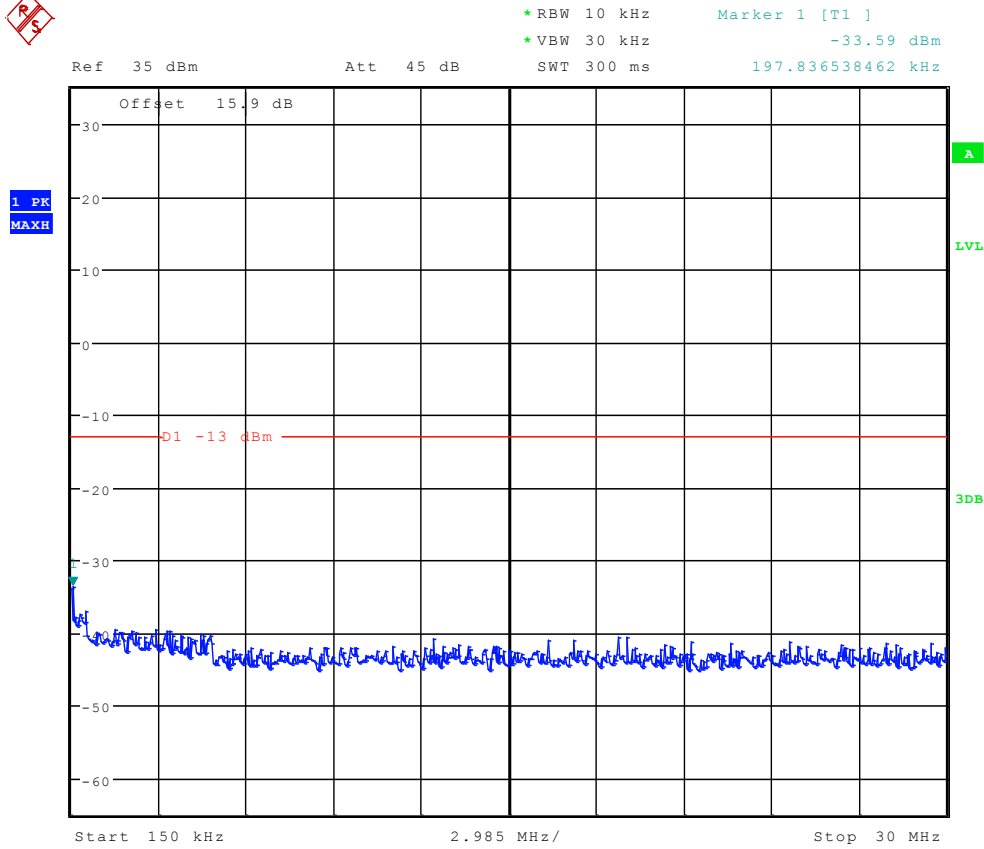
Date: 28.JUN.2012 21:34:24



## Channel 251



Date: 28.JUN.2012 21:32:28

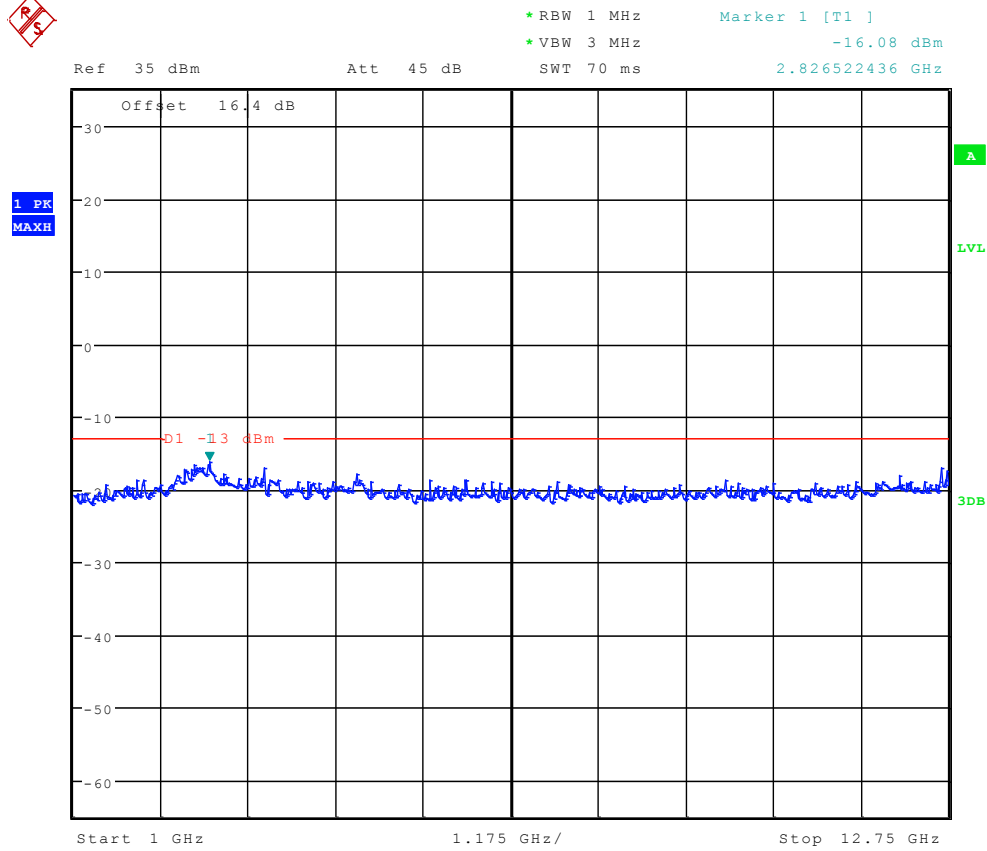


Date: 28.JUN.2012 21:33:11



Ref 35 dB Att 45 dB SWT 100 ms 849.214743590 MHz

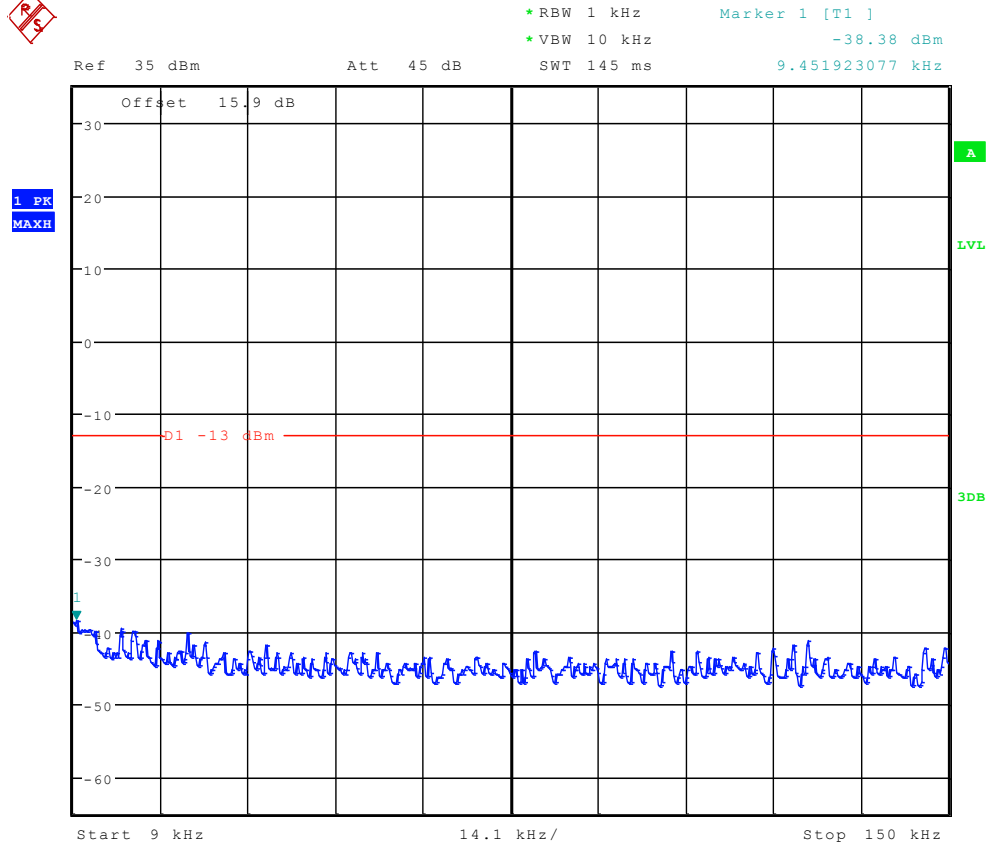




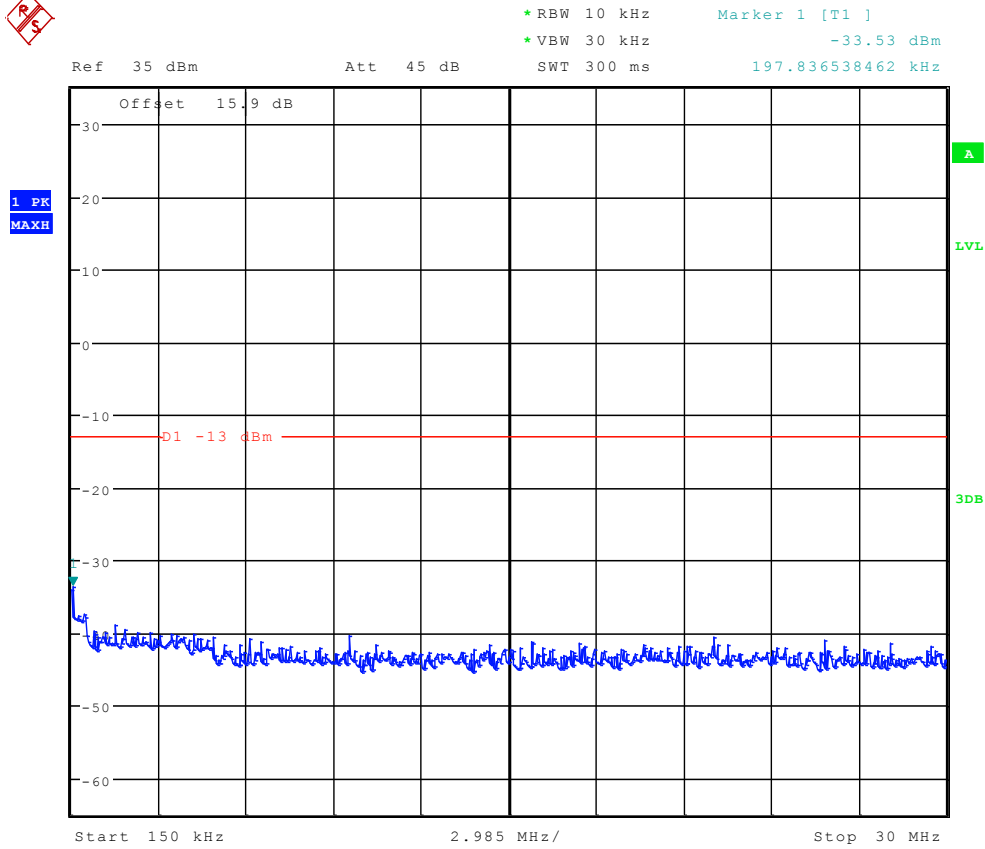
Date: 28.JUN.2012 21:34:39



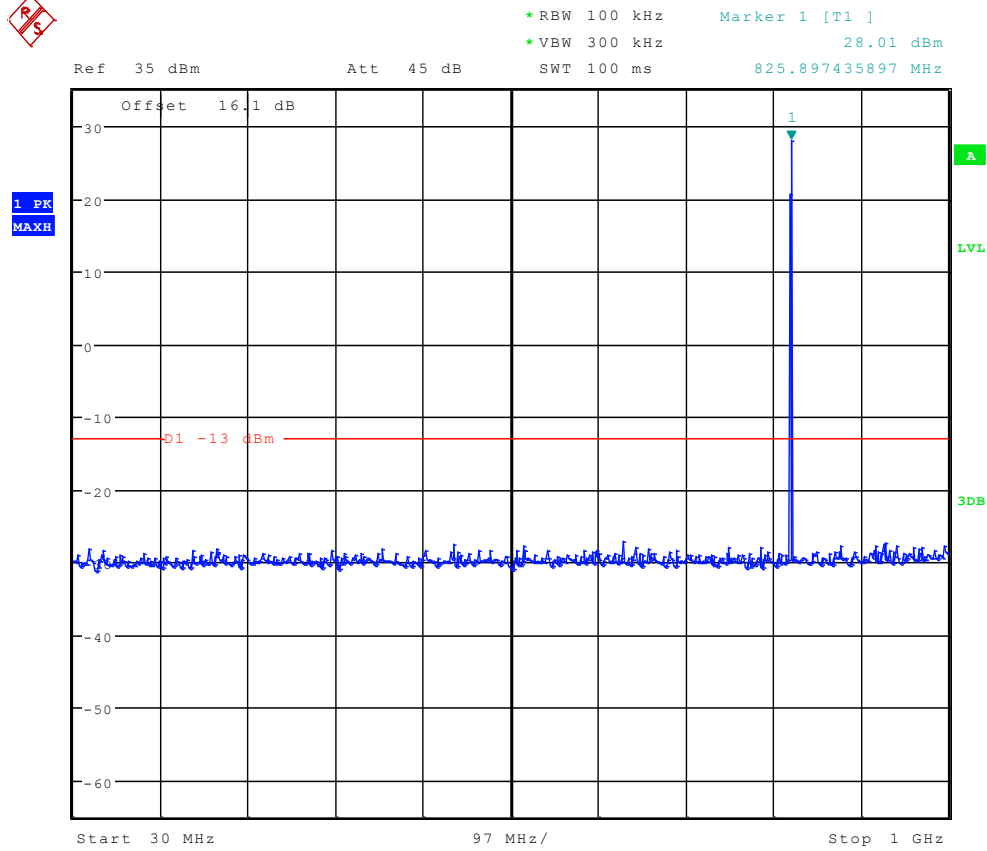
## TM2:EDGE Channel 128



Date: 28.JUN.2012 21:36:40



Date: 28.JUN.2012 21:37:23



Date: 28.JUN.2012 21:38:07

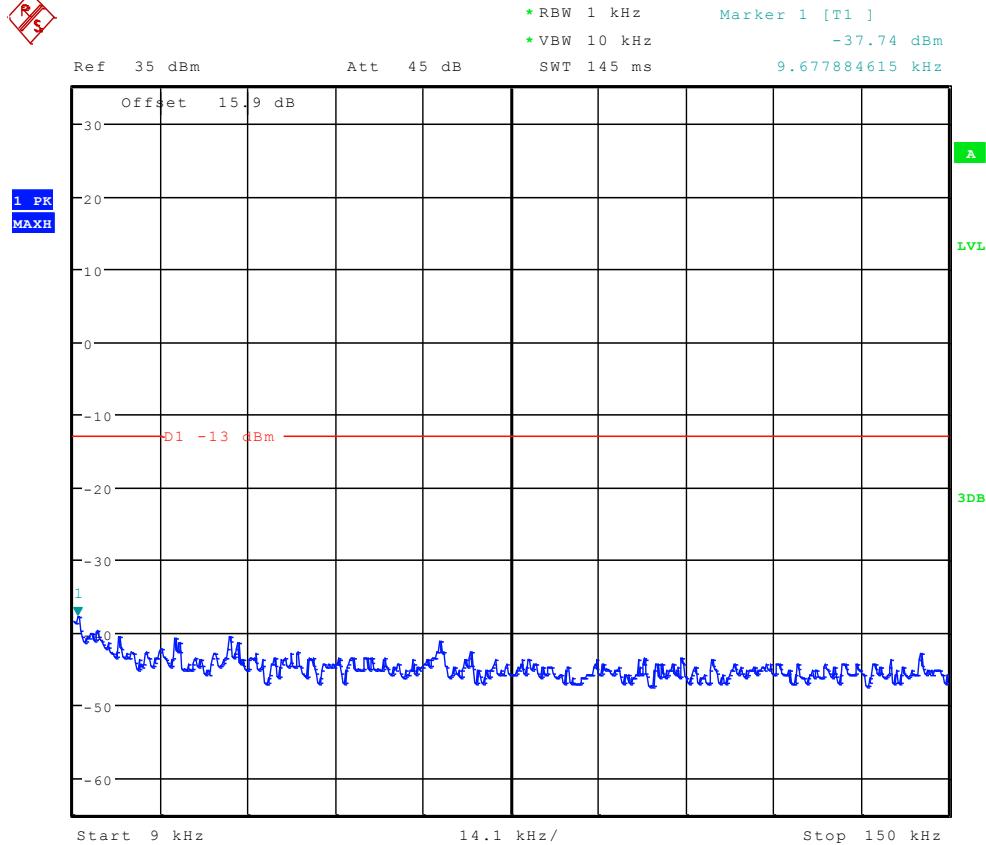


Ref 35 dB Att 45 dB SWT 70 ms 2.657051282 GHz

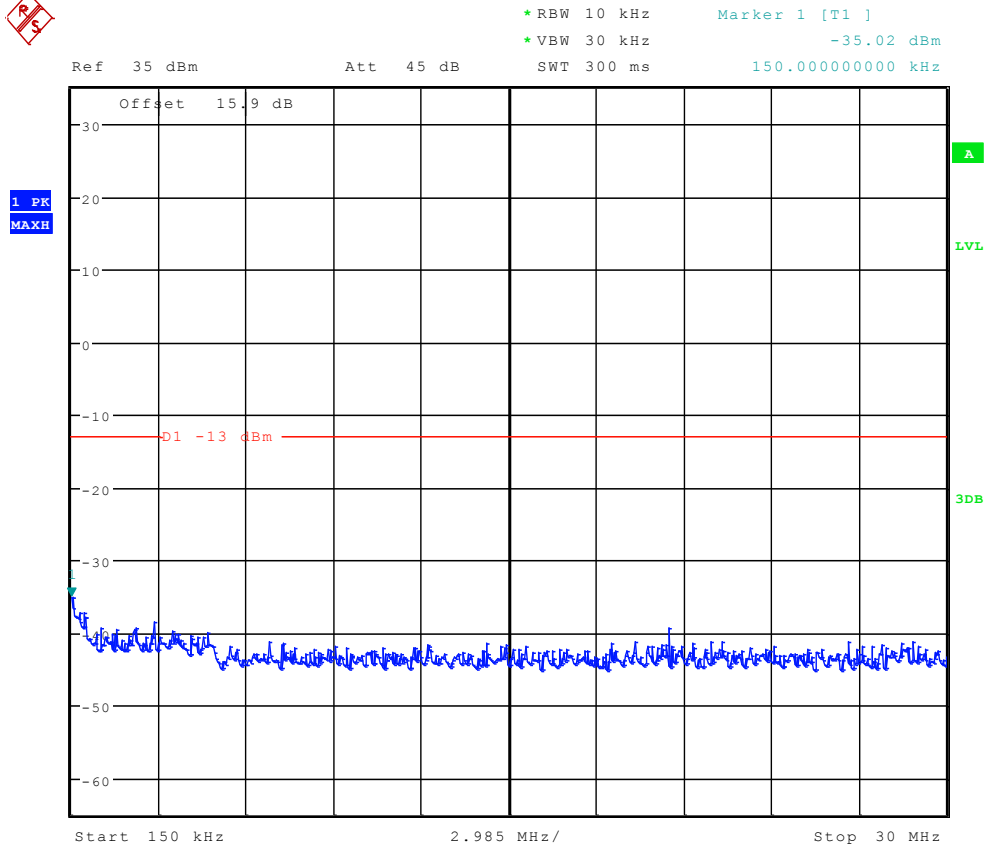




## Channel 192



Date: 28.JUN.2012 21:36:54

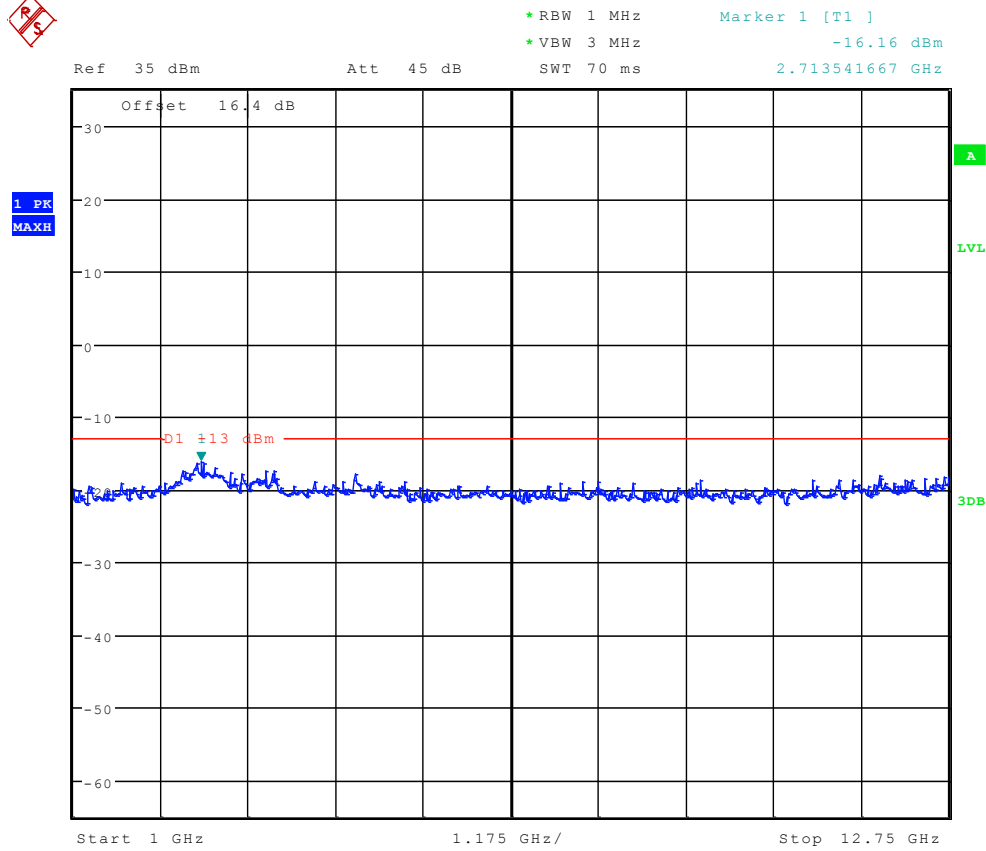


Date: 28.JUN.2012 21:37:38



Ref 35 dB Att 45 dB SWT 100 ms 838.33333333 MHz

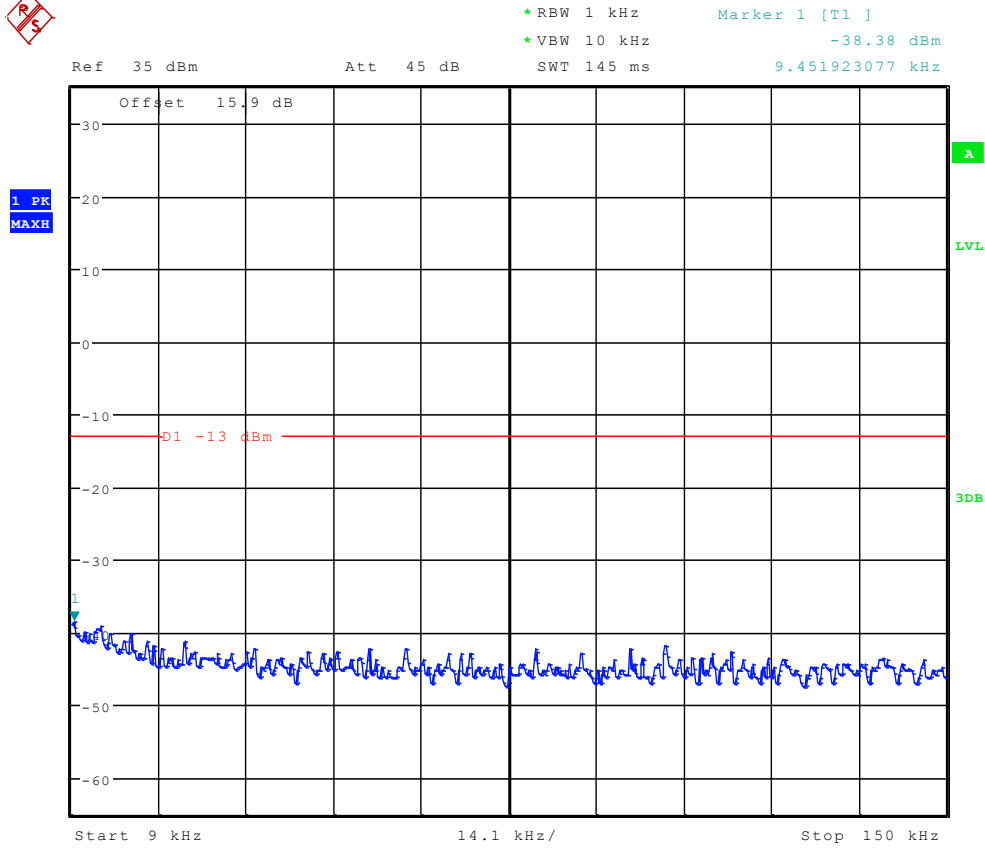




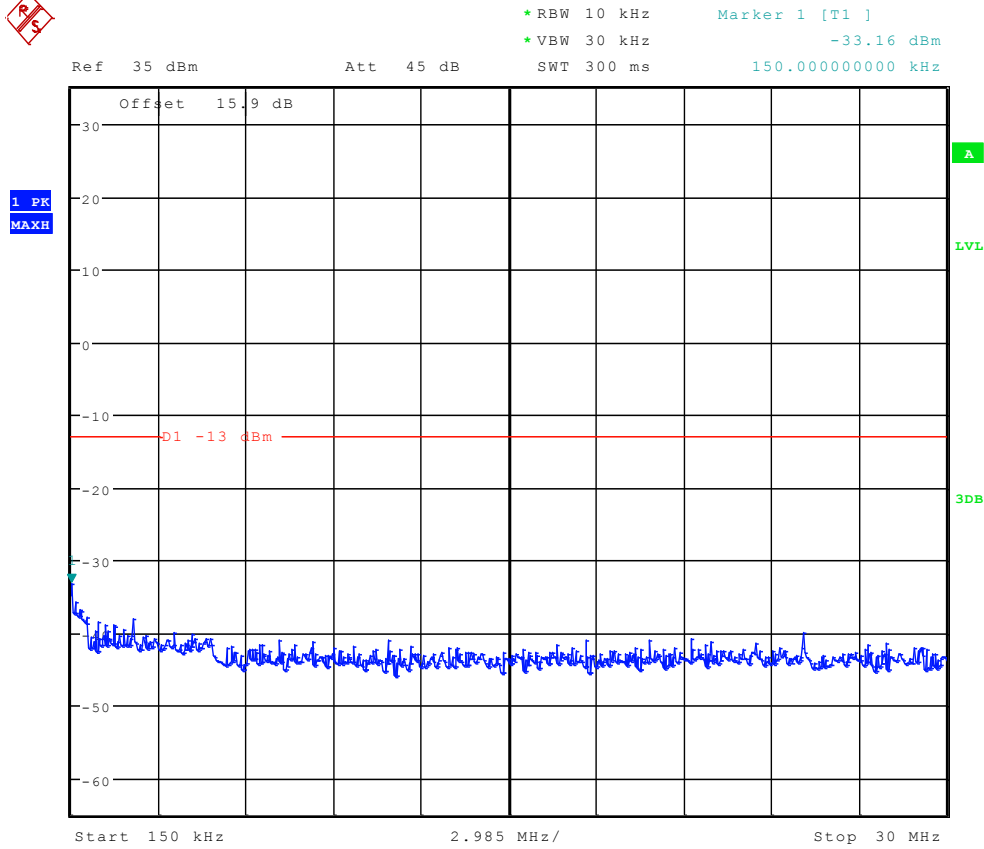
Date: 28.JUN.2012 21:39:05



## Channel 251



Date: 28.JUN.2012 21:37:08

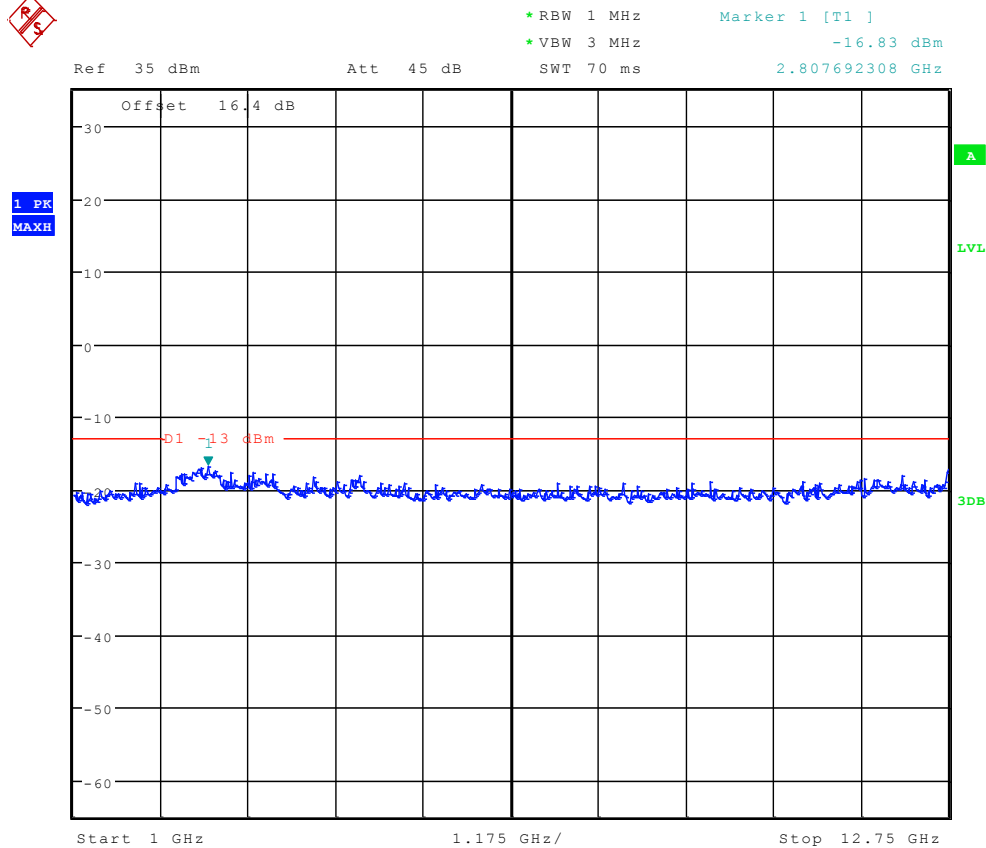


Date: 28.JUN.2012 21:37:52



Ref 35 dB Att 45 dB SWT 100 ms 849.214743590 MHz





Date: 28.JUN.2012 21:39:20

The END

# **Appendix F**

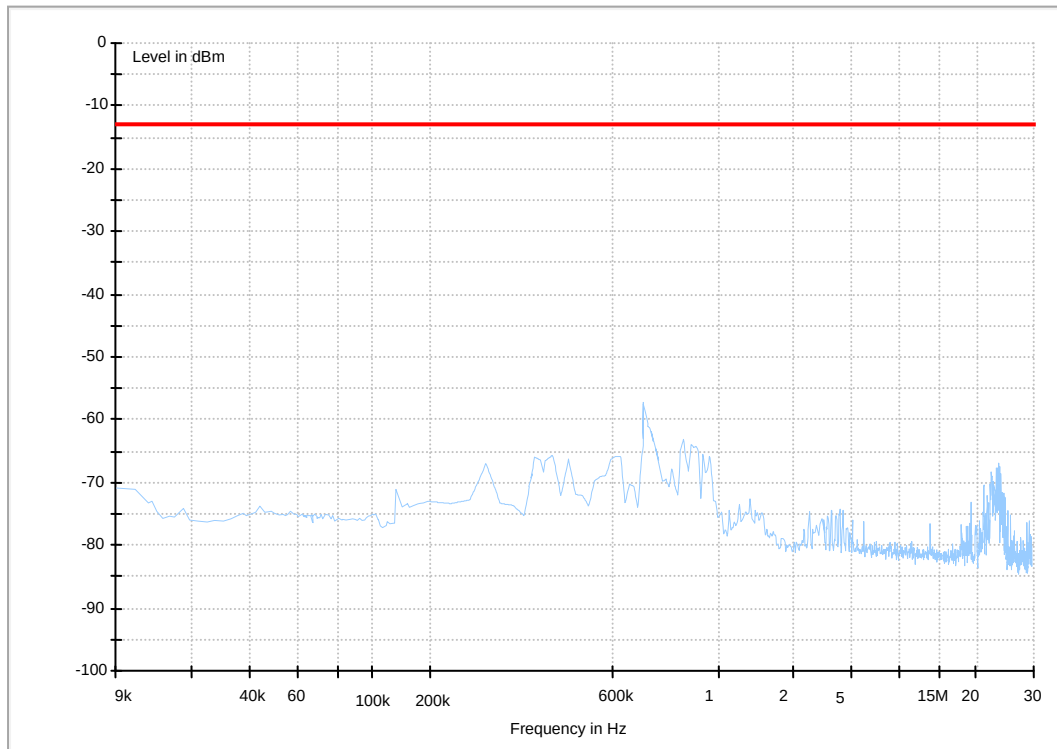
## **Radiated spurious emission**

According to FCC Part 2.1053 & Part22.917

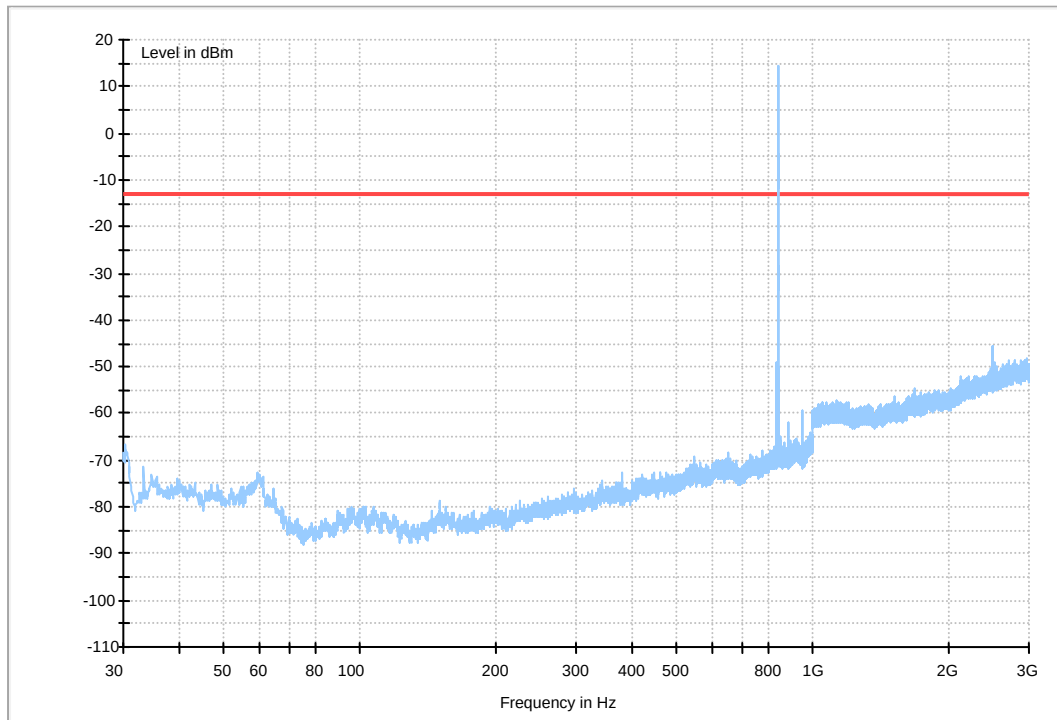
Note: 1. Simultaneous transmission was investigated and no new emissions were found.  
2.  $RBW \geq 100 \text{ kHz}$ ,  $VBW > 3 \times RBW$ .

## GSM 850

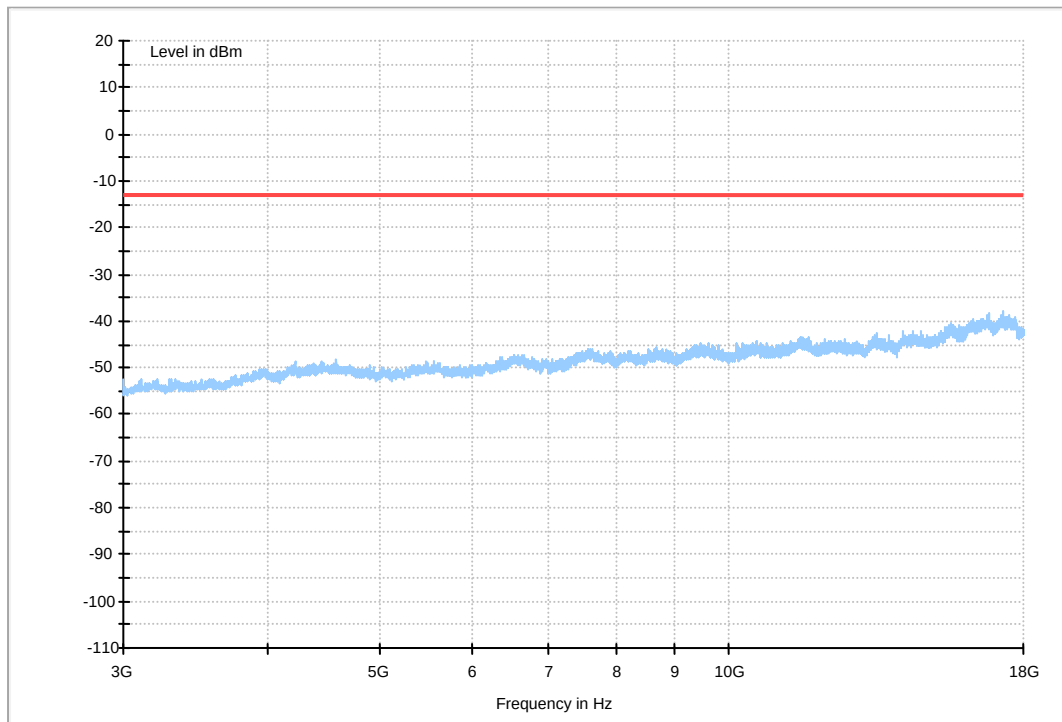
(9kHz~30MHz)



(30MHz~3GHz)

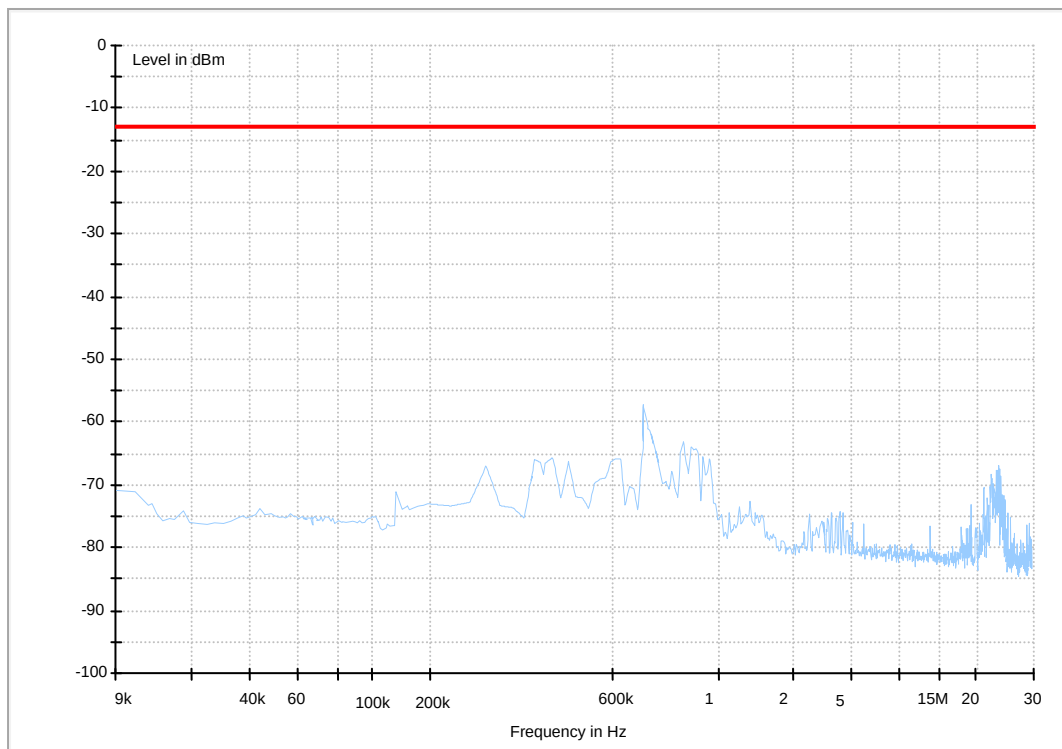


### (3GHz~18GHz)

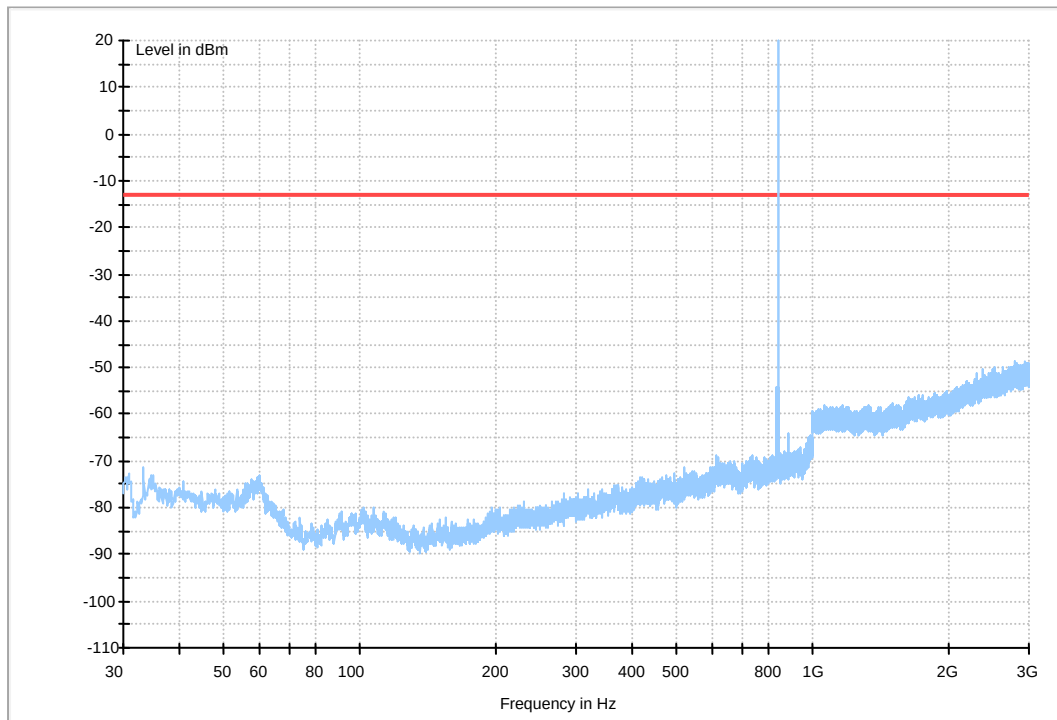


### GPRS 850

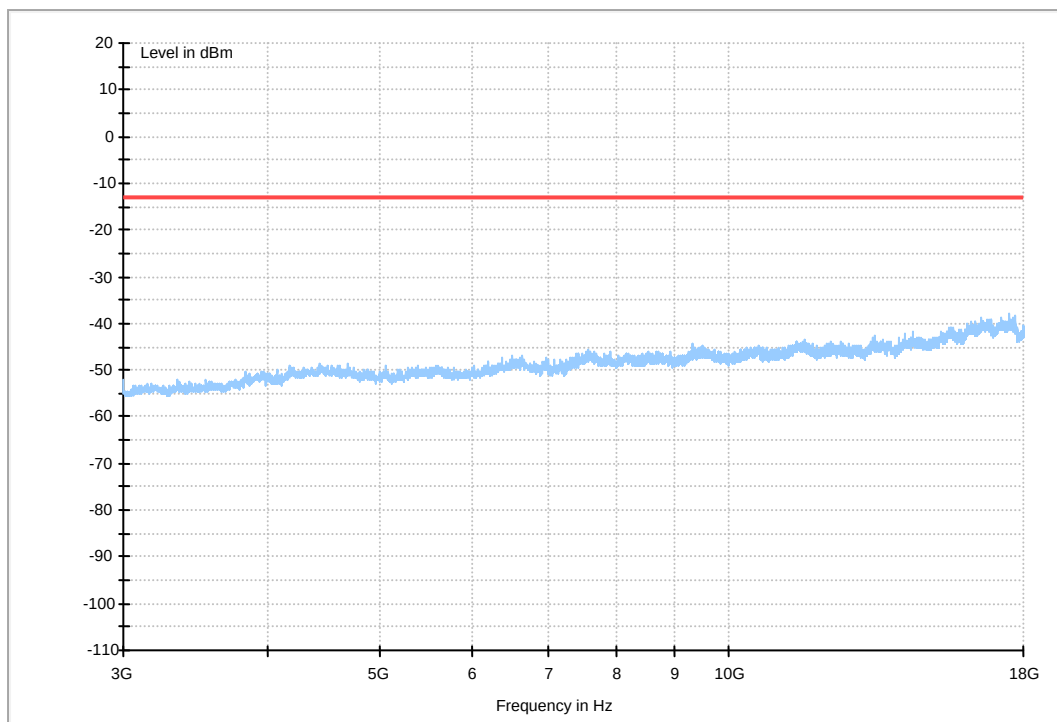
#### (9kHz~30MHz)



(30MHz~3GHz)

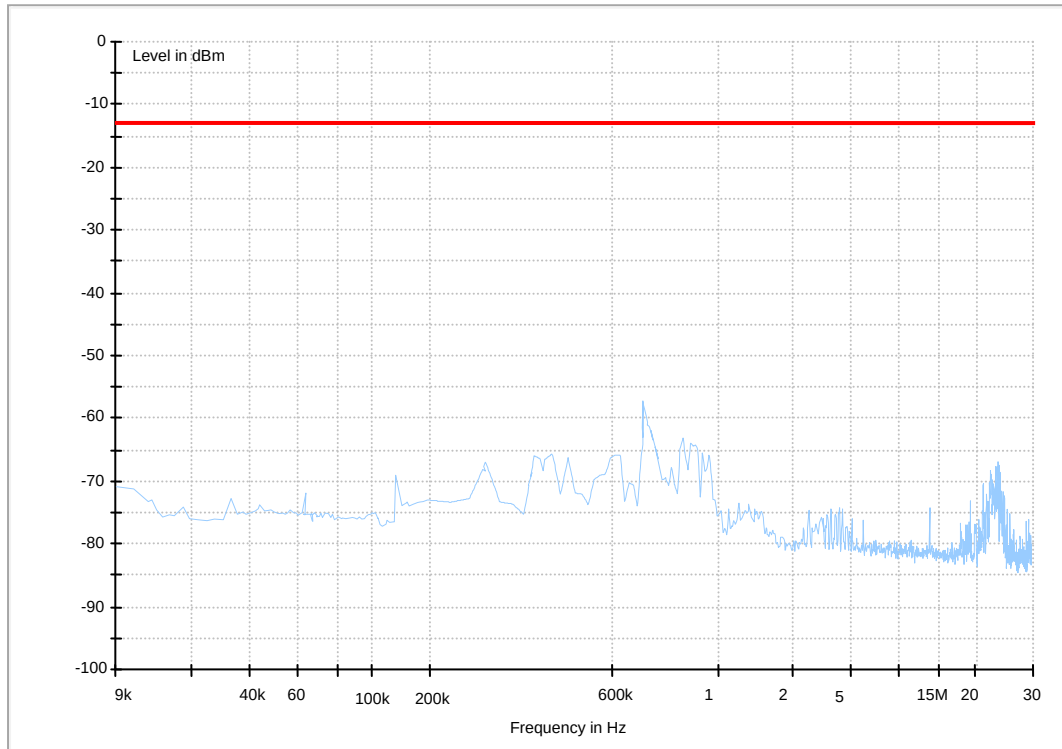


(3GHz~18GHz)

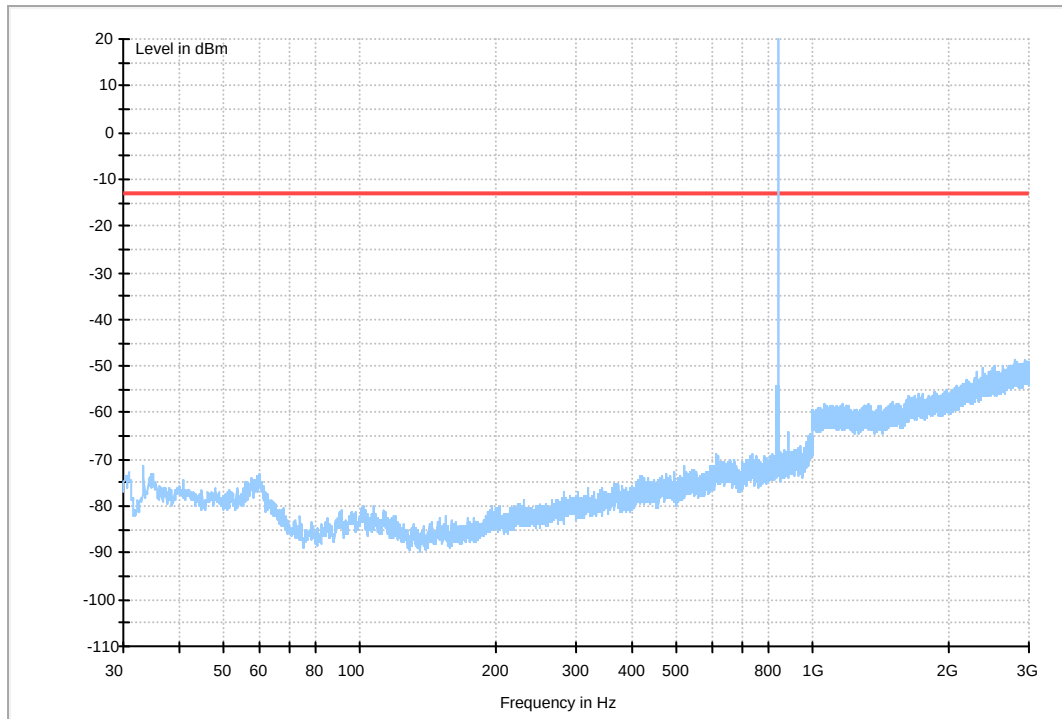


## EDGE 850

(9kHz~30MHz)

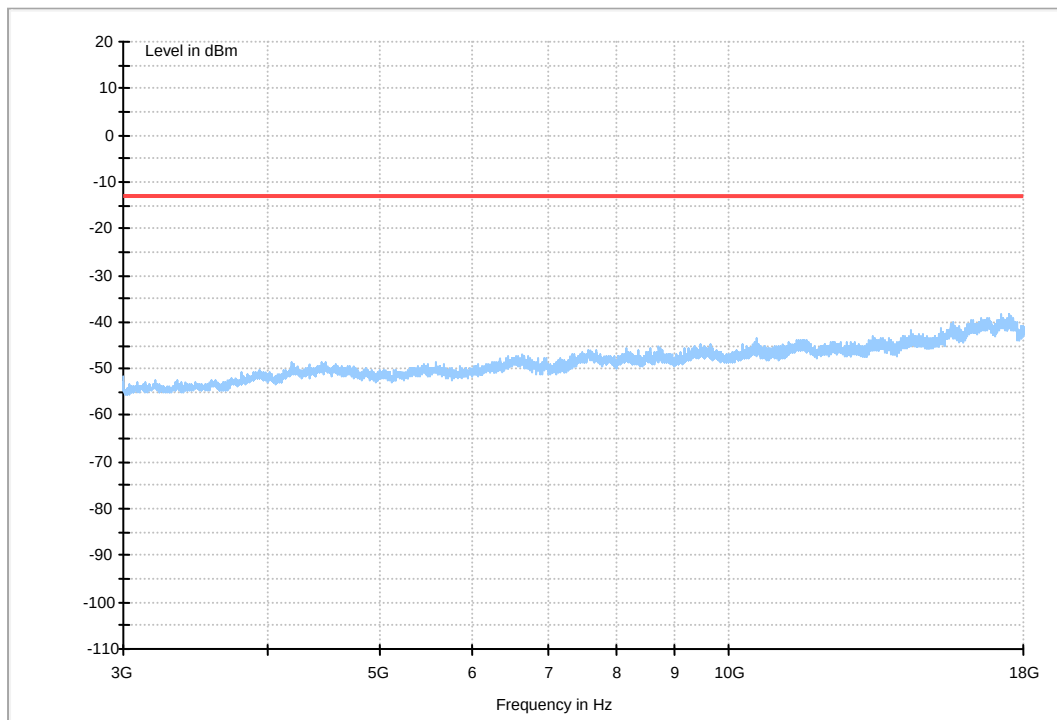


(30MHz~3GHz)



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(3GHz~18GHz)



The END



## **Appendix G**

### **Frequency Stability**

According to FCC Part 2.1055& Part 22.355



## **Frequency Error vs. Temperature:**

| Test Mode | RF Ch. | Volt. | Temp.  | Freq. Error [Hz] | Freq. vs. rated [ppm] | Freq. vs. 20 °C [ppm] | Limit [ppm] | Verdict |
|-----------|--------|-------|--------|------------------|-----------------------|-----------------------|-------------|---------|
| TM 1      | M      | VN    | -30 °C | 26               | 0.03106               | ---                   | ±2.5        | Pass    |
|           |        |       | -20 °C | -13              | -0.01553              | ---                   | ±2.5        | Pass    |
|           |        |       | -10 °C | 25               | 0.02987               | ---                   | ±2.5        | Pass    |
|           |        |       | 0 °C   | -9               | -0.01075              | ---                   | ±2.5        | Pass    |
|           |        |       | 10 °C  | 13               | 0.01553               | ---                   | ±2.5        | Pass    |
|           |        |       | 20 °C  | -7               | -0.00836              | ---                   | ±2.5        | Pass    |
|           |        |       | 30 °C  | 12               | 0.01434               | ---                   | ±2.5        | Pass    |
|           |        |       | 40 °C  | -23              | -0.02748              | ---                   | ±2.5        | Pass    |
|           |        |       | 50 °C  | 17               | 0.02031               | ---                   | ±2.5        | Pass    |
| TM 2      | M      | VN    | -30 °C | -8               | -0.00956              | ---                   | ±2.5        | Pass    |
|           |        |       | -20 °C | -19              | -0.02270              | ---                   | ±2.5        | Pass    |
|           |        |       | -10 °C | -13              | -0.01553              | ---                   | ±2.5        | Pass    |
|           |        |       | 0 °C   | 27               | 0.03226               | ---                   | ±2.5        | Pass    |
|           |        |       | 10 °C  | -7               | -0.00836              | ---                   | ±2.5        | Pass    |
|           |        |       | 20 °C  | -25              | -0.02987              | ---                   | ±2.5        | Pass    |
|           |        |       | 30 °C  | 16               | 0.01912               | ---                   | ±2.5        | Pass    |
|           |        |       | 40 °C  | 18               | 0.02151               | ---                   | ±2.5        | Pass    |
|           |        |       | 50 °C  | 21               | 0.02509               | ---                   | ±2.5        | Pass    |



## Frequency Error vs. Voltage:

| Test Mode | RF Ch. | Temp. | Volt. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Freq. vs. 20 °C [ppm] | Limit [ppm] | Verdict |
|-----------|--------|-------|-------|------------------|-----------------------|-----------------------|-------------|---------|
| TM 1      | M      | 20 °C | VL    | -6               | -0.00717              | ---                   | ±2.5        | Pass    |
|           |        |       | VN    | -11              | -0.01314              | ---                   | ±2.5        | Pass    |
|           |        |       | VH    | -11              | -0.01314              | ---                   | ±2.5        | Pass    |
| TM 2      | M      | 20 °C | VL    | -24              | -0.02867              | ---                   | ±2.5        | Pass    |
|           |        |       | VN    | 28               | 0.03345               | ---                   | ±2.5        | Pass    |
|           |        |       | VH    | 13               | 0.01553               | ---                   | ±2.5        | Pass    |

-----The END-----